

FLIGHT

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AIRCRAFT ENGINEER
AND AIRSHIPS

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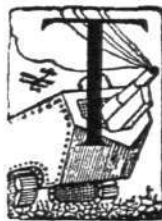
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EDITORIAL COMMENT



THE air is an element in which we imagine that angels might fear to tread. In making this remark we are not alluding to the loading, span, section, or incidence of the wings of the ordinary Christmas-card angels, who so often appear to be on the point of stalling. We are thinking rather of the air as the path of the wicked bomber. To express a sensible opinion on the bomber's powers requires a certain study of recent history and subsequent developments; and Raphael and Gabriel have never qualified to write "*p.s.a.*" after their names.

Such considerations seldom deter the learned layman from telling the world what will happen in the air in the next war. Professor Gilbert Murray is a very learned layman, for whose opinion on a great many subjects we have unfeigned respect. A few days ago he presided over an Anglo-French Students' Conference on Disarmament, and is reported to have said: "We have, no doubt, moral guarantees, but no material guarantees, against war from the air. You can destroy London; we can destroy Paris, but neither can defend. Even the Germans, with no military aeroplanes, have enough commercial aeroplanes to destroy Paris with bombs. The first step to material security is the prohibition of military aviation, as in Germany, and the internationalisation of commercial aircraft companies."

That is the view commonly held by the layman, learned or unlearned, and fostered by the unlearned section of the Press. Professor Gilbert Murray's attainments in other directions do not make him an expert on questions of air warfare, and he seems to have absorbed all the standard claptrap commonly retailed by the sensational papers for the benefit of scaremongers and pacifists alike. The phrase "destroy London" comes easily to the tongue; but do those who use it consider what exactly is meant and implied by the phrase? Has anyone ever reckoned up the number of shells required to make a small town like Ypres uninhabitable? An aeroplane bomb is only a long-range shell, and whether it is more or less accurate than the shell is still

DIARY OF CURRENT AND FORTHCOMING EVENTS

Club Secretaries and others desirous of announcing the dates of important fixtures are invited to send particulars for inclusion in this list:—

1932

- Jan. 9. Rugby: R.A.F. v. The Police, at Imber Court.
Jan. 13. Rugby: R.A.F. v. Middlesex.
Jan. 14. "Interference," Lecture by E. Ower, before R.Ae.S.
Jan. 15. D.H. Technical School Dance, at Portman Rooms, W.
Jan. 16. Rugby: R.A.F. v. Bristol, at Bristol.
Jan. 20. Rugby: R.A.F. v. Cambridge University, at Cambridge.
Jan. 23. Rugby: R.A.F. v. Northampton, at Northampton.
Jan. 28. "Effect of Height on Range," Lecture by A. E. Woodward-Nutt and Flt.-Lt. A. F. C. Scroggs, before R.Ae.S.
Jan. 28. "Indoor Flying Models," Lecture by C. H. Barnes, at City and Guilds Eng. College, S. Kensington.
Jan. 28. Rugby: R.A.F. v. Leicester, at Leicester.
Feb. 6. Rugby: R.A.F. v. Bedford, at Bedford.
Feb. 10. "Some Aspects of Meteorology in Connection with Gliding and Soaring Flight," Lecture by Capt. F. Entwistle, at City and Guilds Eng. College, S. Kensington.
Feb. 13. Rugby: R.N. v. R.A.F., at Twickenham.
Feb. 20. Rugby: R.A.F. v. Coventry, at Coventry.
Feb. 24. "A Flight to Abyssinia," Lecture by Sqdn.-Ldr. J. L. Vachell, before R.U.S.I.
Feb. 24. Rugby: R.A.F. v. United Bank, at Ealing.
Feb. 29. "Flying Boats on Commercial Air Routes," Lecture by C. H. Jackson, at City and Guilds Eng. College, S. Kensington.
Mar. 4. Leicestershire Ae.C. Annual Ball.
Mar. 9. Rugby: R.A.F. v. Oxford University, at Oxford.
Mar. 10. "Results with the New Wind Tunnel at N.P.L.," Lecture by E. F. Relf, before R.Ae.S.
Mar. 16. "Development of Naval Air Work," Lecture by Commodore N. F. Laurence, before R.U.S.I.
Mar. 23. "High-Speed Flying," Lecture by Sqdn.-Ldr. A. H. Orlebar, before R.U.S.I.
Mar. 26. Rugby: Army v. R.A.F., at Twickenham.
Apr. 13. "The North-West Frontier of India," Lecture by Maj.-Gen. S. F. Muspratt, before R.U.S.I.
June 25. R.A.F. Display, Hendon.

disputed. Moreover, bombs must be divided into two classes, namely, those designed for the destruction of military objectives (*e.g.*, factories, railway stations, etc.), and those designed to "attack nerve centres," which is the modern euphemism for slaughtering the civilian population. The latter, if used, would let loose some particularly effective form of gas, and would be practically useless for destroying military objectives. The gas bomb would not be dropped except as part of a deliberate policy by the civil Government of one belligerent nation. Mr. J. M. Spaight, in his series of books on international law and aircraft, has several times asked the question: Would any nation care to be the first to undertake such a policy, knowing that retaliation in kind would follow hard on the heels of the crime? The best way to find an answer to such a question is to ask ourselves what we should consider it sane policy to do ourselves. If we could, despite the use of gas masks, exterminate the population of Berlin on Monday night, would it be policy for us to do it when we knew well that the population of London would suffer the same fate on Tuesday night? What would be the thoughts of the London citizen on Tuesday morning if he heard of the success of the Wessex Bombing Area last night, and knew that, as a direct consequence of that success, he and his wife and children must die of asphyxiation by gas that very night? The nation which started the policy of slaughtering citizens would indeed be fit for a lunatic asylum—and lunatics do not win wars.

There is another point which the exponents of bombing seem to have overlooked, and that is the degree of efficiency attained by air defence. Professor Murray said "neither can defend," but is that true? Several authorities have repeatedly admitted that no measure of defence has been devised which will secure *complete* immunity from air attack to a city. It was wise to make that admission, but it has produced an exaggerated effect. This effect has been enhanced by the orders in recent air exercises that after bombers have been attacked by fighters they should proceed on their way and signal that they are dropping bombs as though they had come in unscathed. There was good reason for those orders. The bombers needed all the practice they could get. But to the unthinking public it made the defence appear futile and the attack irresistible. So far as the casualty figures decided on by the umpires in the air exercises showed anything, they made it clear that attacking London would be so immensely costly to the bombers that no force in the world could have kept up the pressure for many days. Yet in the last exercises London was defended only by fighter squadrons, unaided by anti-aircraft guns and other defence devices.

It is comforting to turn to Gen. E. B. Ashmore's book, "Air Defence," published in September, 1929. Gen. Ashmore was in command of the defence of London in the latter part of the war. He describes how the defence system was gradually improved until at the end it had mastered the "Gotha" attacks. The last raid which they made on London was at Whitsun, 1918, when our defences destroyed about one-third of the whole attacking force. This was so heavy a blow that the Germans never raided London again. It may be said that the

bomber aeroplane has been much improved since 1918 in speed, range, ceiling, and in bomb-load. That is quite true; but the technical side of the defence arms have been also much improved, and it would be difficult to say on which side the improvement has been greatest. Our corps of watchers, our sound-locators, our guns, our searchlights, and our defensive fighters, have all improved out of all recognition. Doubtless the same can be said of French defences. The bomber pilots who set out in the future to attack London or Paris will know that a very large percentage of them will pay for their hardihood with their lives. Again, we may say that when the passage in is thus perilous, few attackers will think it good tactics to leave military objectives alone while they drop gas bombs on residential suburbs.

Finally, Professor Gilbert Murray is reported to have said that the German commercial aeroplanes would suffice to destroy Paris. He was, of course, quoting others who ought to be better informed. The idea apparently is that if you screw a few bomb-racks underneath a civil aircraft and couple up the release gear, you have made an efficient bomber. Possibly such a machine might be of some use for night bombing. If it were to be used by day it would require much more elaborate modifications. Day bombers must fight to defend themselves, and must have rear cockpits for gunners, with gun rings fitted. That is a modification which could not be carried out speedily, or without news leaking through to the enemy's intelligence service. Moreover, what would be the use of any nation in Germany's present position entering upon an air war when she had no fighter aircraft for defence purposes? She might or might not do considerable harm to Paris in one night's bombing, but after that she would lie helpless before the vengeance of the French flying corps.

In short, our flesh has not been made to creep, though possibly the Anglo-French students at the conference enjoyed a few thrills. To all who would lecture on the possibilities of air warfare we recommend a little course of study of the subject, or, alternatively, that discretion which is commonly imputed to the angels.

* * * *

The New Year promotion list of Royal Air Force officers is unusually interesting. Sir John Steel, who commands in India, raises the list of Air Marshals to five, including the Prince of Wales. Sir John is the first officer from the Royal Naval Air Service to reach that rank. The commandant at Halton, N. D. K. MacEwen, C.M.G., D.S.O., becomes

Air Vice-Marshal. We cannot mention all the names, but must refer our readers to the list published elsewhere. Among the new Group Captains and Wing Commanders will be found a number of names which were made famous during the war and since the war. Perhaps the best-known among them are Group Capt. Sholto Douglas and Wing Commanders H. M. Probyn, L. H. Slatter and A. H. Orlebar. In consequence two of the coast squadrons, Nos. 25 and 43 F.S., will now have to be given new commanding officers.



TEMPLE HUNTING IN CENTRAL AMERICA

BY

ROBERT A. SMITH, F.R.O.S., A.R.Ae.S.

(Concluded from page 6)

ON the Isle of Carmen, which is a port of call, there is a small village, most of the population of which turned out to see the airplane. The local idea of 'bus transportation is not all that could be desired. The bridge over the stream on the way to town collapsed some time back, so the passengers all have to get out while the 'bus goes across empty. After getting to the other side, everybody gets in again and the journey continues. This is cheaper than repairing the bridge.

We spent two nights in this place. Most of the population is Mexican, probably 98 per cent. The only industry is the shipment of materials by the various boats which call in from Mexican ports.

On the morning of December 6, we left Carmen, flew south down the Usumacinta River, and at Santa Ana landed on the river in a twenty-mile-an-hour current. Considering the velocity of the current and the fact that this river is full of logs and rather narrow, it was an admirable exhibition of skill on the part of Capt. Ormsby to make a safe landing without damaging the ship. We were able to anchor safely, and Mr. Alden Mason went ashore in a canoe to hold a brief discussion with the Indians on shore. With his return to the plane, we left Santa Ana on this river and landed farther down at another point called Tenosique, again on a narrow river, with fewer logs this time, but an equally fast current. We had some difficulty in anchoring here, finding it necessary to taxi against the current with both motors until the anchor gripped, and then with the anchor firm switch off the engines.

In order for the canoes to come out and take Mr. Mason ashore again, they had to be paddled a considerable distance upstream and then allowed to drift down with the current. As these canoes neared the ship there was a collision among several of them. One of them upset, hurling its occupants into the water. The ensuing spectacle was highly amusing—arms, legs, several hats and the bottom of a canoe, all struggling to keep above water. Because of the fast current we could do nothing to help them. So we took out the movie camera and made some pictures instead.

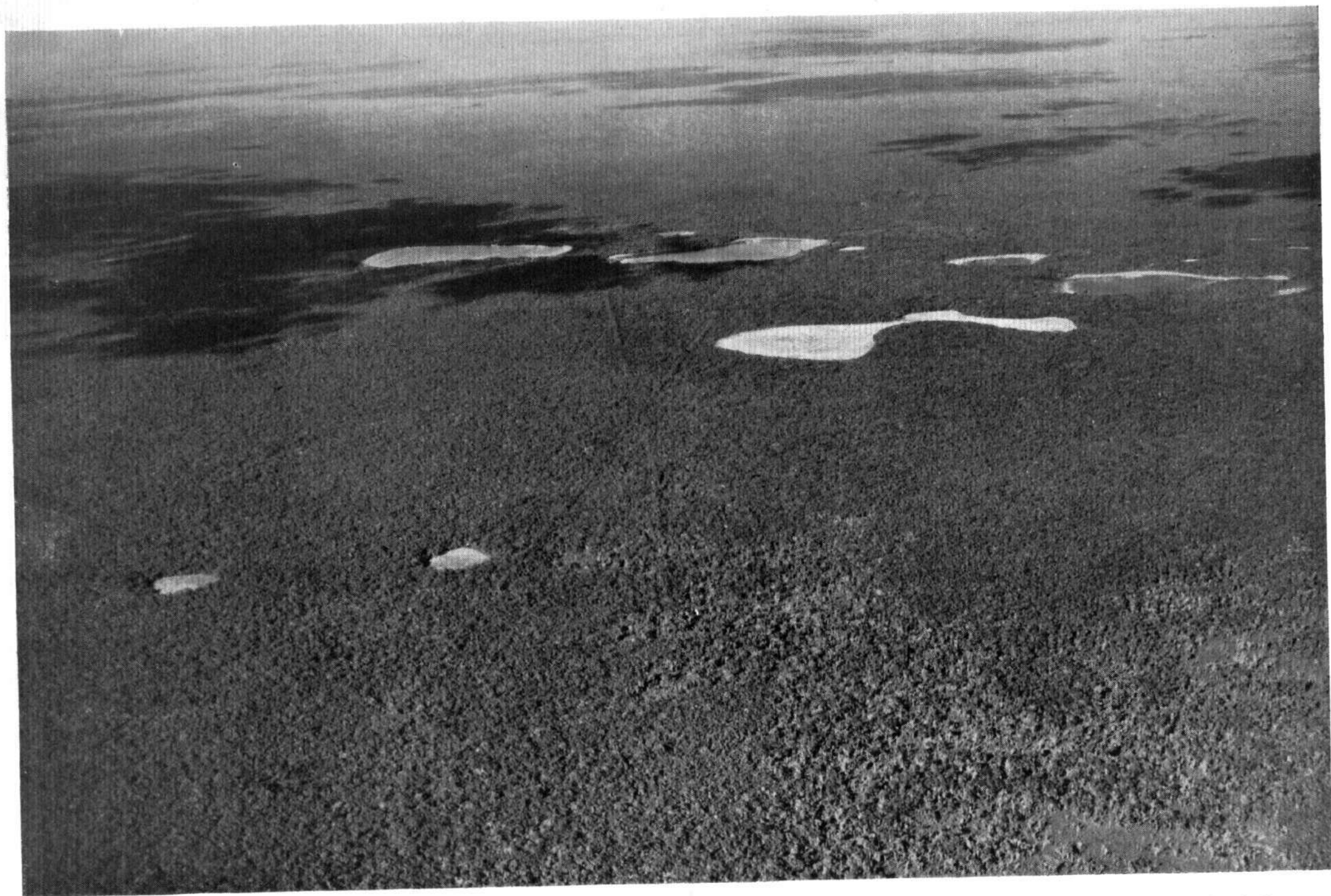
Eventually, by standing out on the wing tip of the ship, we were able to throw a rope to one of the canoes as it drifted past, and thus brought it alongside the plane. One of our party went ashore in the thing, but he confided to me afterwards that he was not very keen about it after seeing all these boys dumped into the dirty river.

Leaving Tenosique later, we flew south through the Usumacinta Gorge, a very beautiful gash with high cliffs on both sides. We followed the river for many miles down the gorge with nothing but high trees and jungles all around. Eventually we reached a point known as Yaxchilan, where we followed a very steep bend in the river which led us over the ruins of Yaxchilan. We then flew back north-west to Lake Petah, the ruins of Palenque and home to Carmen. While flying the last stretch to Carmen, we had the opportunity of seeing a complete rainbow, a very rare sight.

From Carmen, on December 7, we headed for Belize.



The ruins of Labna, Yucatan, first photographed from the air, showing how the forest has encroached on the ancient monuments.



The immense forests at Cobá, Yucatan, with hidden lakes. Note Mayan causeways 1,500 years old brought out by flying late in the day, so that the shadows from the raised causeways can be seen.

passing over several wild deer in the swamps below. During a great deal of this trip to Belize, which was all cross-country, absolutely nothing was seen except mile after mile of tree tops. A great deal of this flying was done at alternate high and low altitudes, as before. About three-quarters of the way over, while flying low, we sighted a large cluster of temples slightly to the right of us, and accordingly changed our course. We flew to these and found a magnificent city entirely overgrown with trees, but sticking up very proudly and prominently. We went down and flew very low, just skimming the treetops, and secured one or two very beautiful pictures of these temples in all their majesty.

As we were leaving this group, we spotted a smaller city of three temples to the south-east, and still flying low, headed off to these and photographed them also, another city as yet uncharted. By carefully noting the time on these detours, we were able to get exact compass bearings on these ruins.

Leaving here, we headed once more for Belize, where we made a safe landing on the open sea and taxied up to shore at that town. That evening and all the next day, December 9, we sat down, compared our notes, charted all the courses we had flown and located all the ruins we had seen.

We took off again on the morning of December 9 to Lake Yaxha, in Guatemala. At this point, we landed on the lake and located some Indians living in a nearby village. Since these Indians agreed to take us to the ruins of San Clemente, we decided to spend three days in the jungle, while the ship went back to Belize. We waved Ormsby goodbye and watched him fly away, disappearing into the clouds and leaving us alone with the Indians in the jungle. Then we set off with them, walked approximately ten miles to a location near the ruins, reaching there that evening. By tying up hammocks to the trees, we slept in a circle around the camp fire, with the Indians keeping the fire going all night in order to prevent the jaguars from bothering us. This was the first time that I had had to sleep in an unalloyed jungle. I was particularly impressed with how very quiet everything was during the night, though the moment the sun began to rise, a terrible racket set up from vocal organs of the local wild life—parrots, monkeys, and many species of animals I had never seen before, including a toucan, which to me looks like a fuselage with two small wings in the rear to propel it.

We did considerable ground photograph work while we were in the ruins. On several occasions, I had to crawl through tunnels on my hands and knees and take flashlights with a clearance of about three to three and one-half feet over my bent back. To crawl through a dark tunnel with a pocket torch, some electric flashlight equipment and a camera, and at the same time keep a lookout for carvings, snakes and any other small fry lurking in the tunnel, is no small undertaking, particularly inasmuch as it is impossible to turn around quickly without banging your head against something or other in the tunnel. I managed safely, however, and secured a very fine set of pictures.

One day at the temple at San Clemente, we discovered a small water well which had dried up, and, wishing to investigate it, let Gregory Mason, he being the tallest of the party, head first into a well with a long stick, while we held his feet, in order that he could poke the bottom to see if it was solid. On finding that it was, we pulled him out, and Alden Mason, the smallest of the party, jumped in and was given a torch to explore what he could find inside. Upon looking around, he located a tunnel running off and stated that he was going to walk through the tunnel, and for us to listen, in case he made any cry while in the tunnel, and to come to his assistance. When



The Sikorsky Amphibian used on the expedition and flown by Robert A. Smith, at rest with its nose on the beach at Lake Yaxha, Guatemala. Its advent at first amazed the native Indian family, but they soon realised the huge bird from which white men stepped out meant no harm, and—as the picture shows—went on calmly with their daily tasks.

he had penetrated the tunnel for a period of about 30 seconds, there was a tremendous commotion in there, and the light went out and a bunch of very large vampire bats made a very hurried exit from the well mouth. It seems that in stooping down to walk through the tunnel, he had bumped his head into a lot of bats hanging on the ceiling, and that they had flapped all around his head, knocking the torch out of his hand, leaving him entirely in the dark in the tunnel. It was very funny indeed to us outside, but Mr. Alden Mason did not appreciate the joke so much until he had got back into the fresh air.

We spent three days this way in the jungle, tied up in the trees, and then walked back to Yaxha in time to find the Captain coming in for landing on the lake (we had to do the last three miles in canoes on the water). We paddled out to the airplane, tied the Indians in their canoes to the back of the ship and towed them across the lake.

It so happened that the Captain was thoughtful enough to bring us a lot of sandwiches, together with some iced beer. Inasmuch as the natives had never seen ice, we took some ashore and gave it to them; quickly word of the new wonder spread, and the whole village turned out to see it.

On our return trip we reached Belize easily, and the following day we headed north over Lake Bacalar, which we had seen once before, and then out over the open sea once more to Cozumel Island, from where, eventually, we made for Cuba, over the Caribbean at 12,500 ft., to pick up a tail wind, passing Cape San Antonio at the east end of Cuba, and landing at Havana, our last stop before Miami.

It was indeed a most interesting flight. From my observations, this is undoubtedly the finest way of making a preliminary survey in order to locate the compass bearings of new temples which lie half hidden in the jungle. Such compass bearings can be turned over to ground explorers who can find the best way in, and explore and photograph the ruins as they wish. It seemed to me, after my experience on this expedition, that with an equipment of two or possibly three ships and with participation of all the people interested in Mayan discoveries, much more effective work can be accomplished. A main supply ship, such as a Sikorsky, together with a Fairchild for photographic work, and an Autogiro of the Cierva type for landing in small spaces which the explorers could clear near the temple, would make an ideal equipment for such an expedition.

During the expedition we took in all 195 aerial pictures and approximately 75 ground pictures in or around the ruins. We saw no snakes at all during the entire expedition, but ran across a tremendous lot of ticks, small animals which live on the limbs of trees. As you push the branches aside to go through the jungle, these little fellows drop down into your shirt and slide down as far as your belt, where they park and bite you vigorously for the period of your sojourn in the jungle.



Armstrong Whitworth and Siddeley Development during 1931

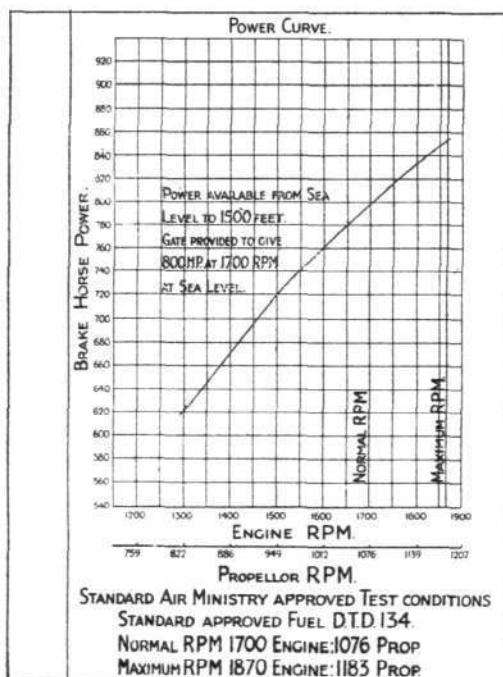
The group of firms under the control of the Siddeley Development Company, i.e., Armstrong Siddeley Motors, Armstrong Whitworth Aircraft, and A. V. Roe & Co., have had a busy year, and it is thought that a brief outline of the work of the firms during 1931 may be of interest. The head of all these concerns is, of course, Mr. J. D. Siddeley, who pioneered motor car development long before he turned his attention to aircraft and aero engines, and who has thus lived to see and take part in the birth and growth of two great industries.

ARMSTRONG SIDDELEY AERO ENGINES

A LOT of detail development work has been put into the big range of Armstrong Siddeley aero engines during the past year. All, with the exception of the smallest, are now fitted with streamlined cylinders, quickly-detachable rocker covers, and enclosed push rods. These improvements have not only enhanced the appearance of the engines, but make them much cleaner in service.

The results of other detail improvements are reflected in the increasing length of service that the engines give without overhaul. Thus, large numbers of machines equipped with "Jaguar Majors" have recently completed 200 hours each without any engine trouble or overhaul, and are still running well. An Avro Ten fitted with three "Lynx" engines has done 600 hours without a top overhaul, and the same machine during the first 129,000 engine-miles only cost for replacements £2 7s. 2d., which equals 0.004 of a penny per mile. The "Jaguar" engines in service on Imperial Airways' North African route, which are now all of the geared type, have covered over 2,043,645 miles.

The "Jaguar Major" or "Panther" engine has been produced in considerable numbers, and is fitted in the following types of aircraft:—Fairy "Gordon," Hawker "Hoopoe," Junkers W.33 seaplane, Vickers "Vildebeest," A. W. Aircraft, Supermarine "Southampton 10" (3), Handley Page "Hare," Rairey IIIF, Supermarine "Air



POWER CURVE OF "LEOPARD III A":
This geared engine is rated at 800 b.h.p. at 1,500 ft. and 1,700 r.p.m.



THE LATEST TYPE OF ROCKER COVER: Note the roller-ended tip and the grease gun nipples for the roller bearings on the tip and pivot.

Yacht " (3), Hawker "Hart," Westland "Wapiti," Norwegian "Ripon," Fokker C.5, Fokker D.XVI, and Swedish Jakdfalk.

A point about the "Jaguar Major" engine is that it has definitely met the present-day

demand for increased performance, with the lightest possible form without sacrificing reliability or durability. In this connection the new A.W.XVI single-seater fighter with "Jaguar Major" has attained a speed of over 200 m.p.h. at its operational altitude of 15,000 ft. The performance of the "Atlas" reconnaissance machine has been improved by 20 m.p.h. by fitting the "Jaguar Major" in place of the "Jaguar," while the "Avro" mail carrier, when fitted with the same engine, attained a speed of 170 m.p.h., carrying 800 lb. of mail, with fuel for 600 miles.

More recently the "Leopard," which is claimed to be the largest air-cooled radial engine in production in the world, has been successfully fitted with a new type of cylinder head. It employs two valves and valve gear similar to that used on the latest "Jaguar Majors." The design has been so successful that the weight of the engine with collector ring has been reduced by nearly 150 lb., while the power has been considerably increased.

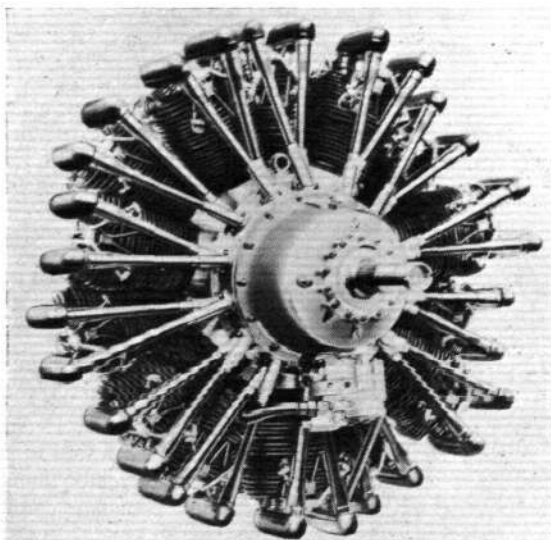
Points of interest in the valve gear are the enclosing of the push rods and rockers, the latter having easily detachable streamline covers and roller-ended tips which bear on the valve stems; the rollers themselves are supported on roller bearings, and a nipple is fitted for lubrication purposes. The rocker bracket is anchored on the cylinder in such a way as to ensure a constant clearance between the rocker tip and valve stem.

A notable increase in power having been obtained by these alterations, the engine (which has passed the Airworthiness Type Test) is now rated at 800 h.p. at 1,500 ft. at 1,700 r.p.m., whereas the old four-valve model was rated at 800 h.p. at sea level, at the same speed.

ARMSTRONG WHITWORTH AIRCRAFT

A great deal of useful work and development has been carried out at the Whitley works of Sir W. G. Armstrong Whitworth Aircraft, Ltd. The works themselves have been enlarged by the addition of a new machine shop and a new drawing office, both buildings being of modern design.

The design of the four-engined monoplanes for the African section of the Imperial Airways' London-Cape Town route has been completed, and the construction of



THE "JAGUAR MAJOR": A 14-cylinder engine rated at 535 b.h.p.

the machines is well in hand. They represent the very latest in aircraft design, and great things are expected of them from the point of view of economy, reliability and comfort.

Two new aircraft have been produced,* one, the A.W.16 single-seater fighter, fitted with an Armstrong Siddeley "Jaguar Major" engine. This is one of the fastest machines in the world fitted with a radial air-cooled

* See FLIGHT of October 16 and 23, 1931.

An Injection "Hornet"

HERE are many, even among those best qualified to judge, who believe that, in spite of the great amount of work which has been, and is being, done on the heavy-oil Diesel-type aero engine, a more promising field of immediate development is offered by the direct injection petrol engine, which, they hold, gives nearly all of the advantages of the heavy-oil engine, and with much better prospects of immediate success and utility.

From East Hartford, Connecticut, U.S.A., we have just received the information that the Pratt & Whitney Aircraft Company has completed and tested a new version of their famous "Hornet" engine, in which direct fuel injection is used. The new engine has successfully passed its dynamometer and flight tests, and has now been installed in a Boeing 40-B.4 mailplane for practical flight tests under actual operating conditions.

After more than a year's experimentation with this form of fuel distribution, the Pratt & Whitney Company claims to have succeeded in perfecting the mechanism which permits the elimination of many of the fuel distribution problems encountered when using carburettor, air scoop and pre-heater on petrol aero engines operating in very low temperatures. It is claimed that the direct injection system has completely overcome the difficulties of cold-weather operation, and that perfect running is assured, regardless of air temperature. Cold starting is said to be greatly facilitated, and, of course, the formation of ice in the carburettor is eliminated.

The Pratt & Whitney "Hornet" injection engine is, apart from the fuel distribution system, essentially the same as the series A.2 "Hornet," which has met with such favour in military and commercial aircraft. The engine has passed its 50 hours' bench tests, and has proved efficient and satisfactory on every test flight made at

engine. Another machine is the "Atlas Mark II." This is a development of the well-known "Atlas" aircraft, which has been widely used for Army co-operation duties. Its speed has been greatly increased by the use of the "Jaguar Major" engine, and, like the A.W.16, its controls, both at low and high speeds, are exceptionally good.

From the above remarks it will be seen that Sir W. G. Armstrong Whitworth Aircraft, Ltd., are successfully meeting the demand for development in the service and civil sides of aviation.

Pratt & Whitney have recently produced a modified "Hornet" engine in which direct fuel injection is used.

The engine uses petrol and not heavy oil

Rentschler Field, East Hartford. Mr. A. Lewis McClain, chief test pilot of the Pratt & Whitney Aircraft Company, expressed his satisfaction with the performance of the engine in flight. The object of now installing the engine in the Boeing 40-B.4 mailplane operated by the United Air Lines is to give the engine a severe testing on a service where every known flying condition is encountered at some time or other. The officials of the Pratt & Whitney Company are confident that the result of the tests will be satisfactory. The development of the fuel injection system is largely due to Mr. Stephen A. Hasbrouck and other Pratt & Whitney engineers.

At present, as we have already said, the injection "Hornet" uses petrol, but it is expected that, when further developments have taken place, the type will make use of the less inflammable fuels, such as the hydrogenated fuel produced after exhaustive tests and experiments by the technicians of the Standard Oil Company. This type of fuel will reduce fire risk in aircraft operation, as it is of such low inflammability. This new type of fuel has shown an increase in power amounting to approximately 10 per cent. in a series of tests conducted by N.A.C.A. engineers. It is produced by the hydrogenation process, with particular attention to high flash qualities, and has an octane number of 82.6 without the addition of any "knock-suppressor." Experiments have indicated that fuels produced by the hydrogenation process have inherent anti-knock qualities. The temperature at which the fuel will ignite is 107 deg. F., as compared with the 28 to 46 deg. F. at which ordinary petrol gas ignites.

The new Pratt & Whitney injection "Hornet" will not, we are informed, be offered to the trade for general use at present, but doubtless, if the tests now being carried out with the engine in the Boeing 40-B.4 mailplane are successful, the engine will be commercially available.

NEW YEAR HONOURS

AMONGST the names appearing in the list of New Year Honours, announced on January 1, are the following:—

Order of the Bath

C.B. (Military Division)

Air Com. Wilfrid Rhodes Freeman, D.S.O., M.C., R.A.F.

Order of the British Empire

(Civil Division)

C.B.E.

Reginald Joseph Mitchell, Esq., A.M.I.C.E., F.R.Ae.S., Director and Chief Designer, Supermarine Aviation Works (Vickers), Ltd. For services in connection with the Schneider Trophy Contest.

M.B.E.

Herbert Harry Adams, Esq., Senior Accounts Officer (acting), Air Ministry.

Royal Air Force—Awards

The Air Ministry announces:—

The King has been graciously pleased to approve of the following awards to the undermentioned officers and airmen of the Royal Air Force:—

Air Force Cross

Flt. Lt. William Evelyn Patrick Johnson.
F/O. Peter Dicken Cracroft.

Air Force Medal

362547 Sgt. Thomas Arthur Newton.

"Interference"

ON Thursday, January 14, Mr. E. Ower, of the National Physical Laboratory, will read his paper on "Interference" before the Royal Aeronautical Society. It has long been known that the interference effects of various parts of aircraft have a considerable effect on its performance, and Mr. Ower's paper gives the results of researches on these effects. From these researches certain conclusions are drawn which are of importance in future design. Among them are that, with bodies of circular or

oval section, the best position for the wings is approximately on the horizontal centre line, while the worst is the low-wing monoplane with the upper wing surface touching the bottom of the body. The wing on the top of the body is also definitely bad, but both the high- and low-winged monoplane can be improved by suitable fairings at the wing roots. The effects of engine nacelles and wing tanks are also discussed and the best positions indicated. The lecture will be held at 6.30 p.m. in the Lecture Hall of the Royal Society of Arts, 18, John Street, Adelphi, W.C.2.



FLIGHT Photo.

More Fairey Aircraft for Belgium



THE "FIREFLY" (ROLLS-ROYCE "KESTREL" ENGINE): One of the machines of which considerable numbers have been ordered by the Belgian Government.



AN ANGLO-BELGIAN ENTENTE: Left to right, Adjutant Caryn of the Section Technique at Everes, Adjutant Verboomen, also of the Section Technique, Sqdr.-Ldr. M. Wright, Foreign Representative of the Fairey Company, Captain Guillaume, of the Section Technique, Flt.-Lt. Staniland, and Flt.-Lt. Hilton, both Fairey Company test pilots. (FLIGHT Photo.)

THE Fairey Aviation Co., Ltd., informs us that through *Avions Fairey S.A.*, of Gosselies, Belgium, a contract has been received exceeding in value £300,000 for aircraft and engines. It would appear that the Belgian Air Force is well satisfied with the products of the Fairey company already in commission, as this repeat order, which exceeds 60 aircraft, has been received before the completion of the first contracts, received last year. This is the most important contract which has been placed by a foreign government with a British firm since the contract placed by Belgium last year with the Fairey Aviation Co., Ltd., and was secured by the Fairey company in the face of very keen competition. The demonstration machines sent over, it is claimed, went through their trials without the slightest hitch.

The sixty-odd aircraft ordered will be of two types: The "Firefly" single-seater fighter and the "Fox II" two-seater.

The "Firefly," one of which is shown in one of our photographs, is a remarkably clean machine, its lines being very easy and its fuselage of small cross-sectional area as well as of good streamline form. It is claimed that during the acceptance tests held some time ago the "Firefly" definitely proved itself the world's fastest single-seater fighter.

The two-seater "Fox II" is a descendant of the original "Fox" introduced by the Fairey company several years ago, when it had a performance far outclassing any two-seater of that time, and being well ahead of most single-seaters in speed.



ONE OF BELGIUM'S NEW TWO-SEATERS: The Fairey "Fox" (Rolls-Royce "Kestrel") above the clouds, piloted by Mr. Andrew, one of Fairey's test pilots. (FLIGHT Photo.)

Mr. Fairey was dissatisfied with the performance of the machines in use then, and set out to show that if all the paraphernalia which it had been customary to mount outside the fuselage was placed inside, a performance far and away better than anything previously achieved could be obtained. He succeeded, and in so doing set a new fashion in light day bombers, a fashion which persists to the present day, and which has probably led to a greater improvement in aircraft generally than has any other type of service aircraft.

Both the "Firefly" and the "Fox II" are fitted with the Rolls-Royce "Kestrel II" supercharged engines, whose small frontal area plays an important part in achieving the very high performance of the machines. These engines were, of course, designed and constructed in the same works as those which produced the engines for the Schneider Trophy machines of the Supermarine Aviation Works, and share with the Schneider engines, although naturally in less degree, their high power for weight ratio and clean lines, as well as the superb workmanship which has made the Rolls-Royce name famous and respected the world over.

Great Britain can be proud of an aircraft industry which can thus more than hold its own against foreign competition, and the Fairey Aviation Co., Ltd., and Rolls-Royce, Ltd., are particularly to be congratulated upon having been chosen to uphold British prestige abroad in this way.



ROYAL INTEREST: H.M. the King of the Belgians inspecting a Rolls-Royce aero engine shown at the Brussels Exhibition. A large order for these engines has been placed in this country by Belgium.

"BUY BRITISH": Three of the batch of Fairey "Fox" aircraft ordered by Belgium. (FLIGHT Photo.)



PRIVATE FLYING AND GLIDING

WELCOMING 1932—

AT
HANWORTH PARK

I SUPPOSE everyone has their own idea of how best to welcome the advent of a new year. Some just go to bed saying, "Well, the new year will be much the same as last year, so why worry? My staying up till midnight is not going to make it any better." They are the pessimists, the type that has done more damage to our trade through lack of grit than anyone else. Then there is another kind, like my Uncle Tobias, who swore on his father's death-bed that he would start each year with a clean sheet. He hangs on to his money as long as he can, but at midnight on December 31 each year he signs a cheque for every one of his debts (*some overdraft, I always think to myself!*). Others, like George and I, like a little gaiety, and this year we found it, good and hearty, at Hanworth. George did not know Hanworth, so I took him under my wing—he won't run down flying clubs any more now, I can assure you!

On our arrival, after parking the car under the direction of an autocratic, but unusually efficient, man with a red lantern, I took George into the club-house. "Good heavens!" he said, "is this the Savoy or a Flying Club? I always thought flying clubs were sort of Army hut affairs." George is many years out of date! I think the uniformed hall porter (black and orange, naturally), to say nothing of the somewhat hectic-looking "nippies" (also much nicer in black and orange), rather overcame him, but he soon got acclimatised, and by the time he was firmly entrenched in a corner of the oak-panelled bar, grasping his third "gimlet," he was looking quite at home. (Though the fire was too hot for him to put his feet on the mantleself.)

One of the first things to catch his eye was the collection of caricatures hung round the walls. "Dickson" certainly hits the mark each time, and everyone of note who visits Hanworth gets "hit" by his facile pen.

"I say, this is the most comfortable bar you've taken me to," George grunted, just when I was thinking that, if only he was a member, he could stand me one for a change. "Well, how many times have I told you that Hanworth is just the sort of place you ought to join?" I was really feeling rather peeved, for George has consistently refused to have anything to do with flying.

He didn't take much notice, for he was in deep conversation with Mr. Rawson, the test pilot for the Autogiro firm, which has now opened a sales depôt at Hanworth. Mr. Brie, who is Mr. Rawson's assistant, was also hovering around (without his "windmill"), and I heard from him that the new three-bladed open two-seater has a far better take-off than its predecessors, as well as a higher rate of climb.

Had dinner not been announced as ready at that moment, I really believe George would have "signed on the dotted line" for one of the cabin, C.24, Autogiros—it's amazing how quickly some people change their ideas about flying!

They do you an awfully good dinner at Hanworth now—much better than it used to be—and for this occasion the accommodation was increased by putting tables in the lounge as well. Turkey and Christmas pudding were, of course, part of the menu, though I rather agreed with George when he petulantly decried the idea of calling it *Dindon Roti* and *Pudding de Noël*—after all, both are rather English, aren't they?

Paper caps then came out of the crackers, and things became gayer altogether. Mrs. Cotton looked very chic (as the Sunday papers say) in a pale blue fez-like creation. Maj. Cotton, as I told George, is the pilot who started out to rescue young Courtauld from Greenland's icy mountains last year, and his "Bellanca" machine is now housed at Hanworth. Everyone who flies it goes into raptures, so it does seem a pity that some English factory doesn't compete in the same market. Surely there must be a demand for a six-seater with the performance of the "Bellanca"

among the taxi people. Courtauld was married last Saturday, so I suppose he won't be building any more igloos for a while.

George was thoroughly roused by this time, and I found that he had already, so to speak, filled his programme for the dances to follow. As a matter of fact, I did not have much trouble looking after him, for both Mr. Noel (no pun meant) Smith, the Secretary of N.F.S.; and Mr. Bramson, the Chairman of the Club Committee, were indefatigable in seeing that everyone knew everyone else. Mr. and Mrs. Bramson had as their guests Mr. and Mrs. Blumenfeld Elliot. Mr. Elliot is the son of the famous R.D.B., editor of the *Daily Express*, the so-called "Father of Fleet Street," and, judging from the success he has so far made of life, I imagine that he will go as far as his father, if not further (George, to whom I showed this report of the evening, tried for a long time before he could repeat that sentence quickly); most likely to be farther, I think, for he is largely responsible for development of traffic on the Southern Railway!

Mr. Wallace Barr came along about this time, feeling very cheerful after having prepared himself to celebrate the 21st birthday of his firm. 1932, he told us, was the 21st anniversary of the year he started making dope for aircraft, and he, more than anyone, was counting the minutes to midnight! (FLIGHT's cover for last week depicted the history of the Cellon firm, and showed many of the notable aircraft which have been doped with Cellon from his factory). I was just talking about this, when there was a crash, and a figure in a messenger boy's uniform with a parachute trailing behind, slid across the floor. When the crowd had been pushed back, George was able to get his first view of Mrs. Victor Bruce, the same, I told him, who made that very wonderful solo flight round the world (except for the Atlantic and Pacific) in a "Bluebird." She is always up to some prank, and her arrival was to signal the end of the old year. She brought with her a telegram from the inhabitants of Mars (very warlike and not a good omen—Ed.), greeting all British pilots and the members of Hanworth Club. Later on—I mean early the next day—we had further taste of her versatility when she carried through a cabaret turn with Messrs. Geoffrey Dorman and R. Copeland. Her "Hula Hula" dance, with nothing but a thatching of dried grass between her and us, was marvellous, and it was only my suggestion of a visit to the bar (kindly placed at our disposal through Lord Trenchard at such an early hour) which saved George from joining in. I thought Geoff looked a bit chilly without his skirt, for even his beloved messenger boy's cap was insufficient to hide his manly legs after "Copey" had committed the drastic act of deba—, I mean deskirting him. Copeland has rare flair for the Ukelele, and I suppose he will use it to keep his brother pilots awake in the air. It would look well on the cover of a book, wouldn't it?—"Us! Uke and Aircraft" or "The Flying Minstrel Boy"!

We had both had our fill of dancing by now, and after getting another laugh at the expense of Mrs. Victor Bruce, who was this time "taking off" Fred May in several of his songs, we braved the fog to London again. I left George at his club with the aviation bug firmly planted in him, and was not a bit surprised when he rang me up the following morning. "I've been thinking about this flying business," he said "I suppose there are other clubs like this one you took me to last night, aren't there? I mean Hanworth isn't the only one that isn't an Army hut?" "Good heavens! no," I retorted, "there are real live clubs in almost every part of the country now, and they do other things than sing and dance! They have had a hard time lately, since many of them have lost the majority of the Government subsidy which they used to get, but there is a movement on foot to do something about that, and several schemes have been suggested. One is that put up by Alan Goodfellow (see p. 34), of the Lancashire Aero Club; if this were adopted, things would look much rosier for the coming year. The amount of flying they all do is undoubtedly of inestimable value to the country, and any money spent on keeping them going would be a wise investment. Why don't you get your uncle interested in it; he's on the Treasury Bench, isn't he?" "I will," returned George; "and I tell you

another idea: how would it be if each town were to subsidise its own flying club? I suppose £1,500 to £2,000 would just make all the difference to them, wouldn't it? Well, my old man is a power in the municipality of Townham; I'll see if I can't get him to set an example to the other places; after all, some of them spend more than ten times that amount on a puddle for small boys to sail boats in." "George," I said, "darned if I don't take you to every flying meeting I can next season!"

C. N. C.

NEW INDIAN FLYING CLUBS.—The opening ceremony of the Lucknow centre of the Delhi and United Provinces Flying Club was performed on November 28 by H.E. the Governor, Sir Malcolm Hailey, before a distinguished gathering. The Governor, who was welcomed by Syed Wazir Hasan, Chairman of the Club, declared the club open in a short humorous speech. The programme consisted of formation flying by "Gipsy Moths," display of trick and crazy flying, aerobatics and aerial bombing. The Governor and Lady Hailey had a flight for about 15 min.

On November 30 the Governor opened the Cawnpore branch of the Delhi and United Provinces Flying Club. In his address he said: "Looking at my engagement list it seems to me that the opening of flying centres has become almost a habit and I suppose that the more the habit grows the better will the Delhi and United Provinces Flying Club be pleased. Lucknow and Cawnpore have taken the lead and we shall soon begin to ask what Allahabad, Benares, Agra and Meerut are going to do about it. Nothing, I know, would make you happier than to feel secure of the future in which aviators of all the great cities in the Province would be up in the air together. When that dream has finally been achieved then the Province will look back with a great deal of gratitude to the pioneer efforts made by Delhi and the United Provinces Flying Club."

BROOKLANDS.—Despite the fact that the School has been closed down for the past week, two enthusiastic pupils turned up on Monday and routed out the Managing Director from his fireside to give them instruction. The Repair Section had reopened on that day, so the difficulty of finding ground staff was overcome, and a few hours' flying were put in.

Overtime has been the order of the day lately in the Repair Section; in fact, two unfortunate ground engineers had to work all through the night of December 31 on a rush C. of A. job.

The new club-house is now complete, and awaiting the arrival of the furniture vans. It has been decided to run a special Brooklands "At Home" Sunday every fortnight, when demonstrations of all the leading aircraft will take place. When the club-house is opened, members will be able to obtain meals and drinks at popular prices.

Pupils are reminded of the Sunday evening lectures which commenced on Sunday last, January 3. These are held in the Lecture Room at Brooklands every Sunday

evening from 5 to 6.30, and the fee for the whole course of eight lectures is 2½ gns.

Mrs. Angela Joss, the Club's youngest lady pupil, is now rapidly approaching the solo stage.

Club instructors have returned to duty feeling much refreshed after their well-earned week's rest. Mr. Lowdell, our Chief Instructor, spent his time fishing at Felixstowe, and returned with a bag of three small cod, weighing ½ lb., and one dozen tiddlers.

The Club welcomes back its old friend, the Hon. Dick Westenra, who has been doing a considerable amount of flying on his Gipsy II machine.

Negotiations have now been completed with the Cinque Ports Flying Club at Lympne whereby this club will be taken over by Brooklands Aviation, Ltd., as and from January 1. Mr. W. E. Davis will be installed as manager. The schemes under-way for improving this club include a first-class service station for private owners as well as full club-house amenities. Lunches will be served daily, and a hearty welcome is extended to all private owners to make use of the club premises.

PORTSMOUTH AND SOUTHSEA GLIDING CLUB.—

For some time now the Portsmouth and Southsea Gliding Club has been using the auto-launching method in their activities, and with considerable success. With the wind in the wrong direction for hill flights, this method enables members to make flights of three or four times the duration experienced with ordinary shock launching on the flat. Proficiency is gained much more quickly, and it is also extremely helpful in launching machines from the top of Portsdown Hill giving flights of greater length, thus helping in the obtaining of "B" certificates.

An invitation is extended to private owners of sailplanes to make use of the site on any Sunday afternoon. It is an excellent soaring site, Herr Kronfeld having remained up at will for over 1½ hr. during his visit to Portsmouth in 1930. There is always a large number of spectators from whom a hefty launching team can be obtained, and from 1 to 2 o'clock there are several members who would willingly help in rigging, etc. This invitation is subject to the Club being free from any liability, and that normal club activity is not interfered with. Intending visitors should choose a day with a southerly wind, and if possible write beforehand to our Mr. Yates, "Falklands," Stanford, Bordon, Hants.

New members are welcomed, and those interested should write to the Hon. Secretary, 14, Middle Street, Portsmouth.

THE SWINDON AND NORTH WILTS Light Aeroplane and Glider Club have obtained a new gliding site at Wick Down, Hackpen, near Swindon.

AN AMERICAN GLIDING RECORD.—Lt. William Cocke, of the U.S. Army Air Service, claims several world's gliding records. At Honolulu recently he remained in the air for 21 hr. 34 min. 15 sec. and reached an altitude of 3,500 ft. He covered a distance of about 400 miles, which beats the 283 miles' record established by the German holder, Herr. F. Schultz.



The new Brooklands Club House, which is now nearing completion. This imposing edifice has been built under the direction of Airwork Ltd., who have embodied in it many of the lessons they have learnt from their own buildings at Heston

THE FLYING CLUB SUBSIDY

THE ELEVATOR," which is the official organ of the Lancashire Aero Club, and is edited by Alan Goodfellow and James Hembrow, has, in its issue for January, 1932, put forth a very sound statement of the facts as they stand to-day concerning the subsidy question. Furthermore, an excellent proposition is made for the future awarding of subsidies; a proposition which should, we feel, be examined very carefully. This is what they say:—

"The D.C.A. and the Clubs"

"It seems opportune, now that the D.C.A. has brought the matter up by his speech at the Clubhouse opening, to refer once more to the question of the Air Ministry Agreement with the Light Aeroplane Clubs. It is true that the present agreement does not expire until next July, but we made the mistake last time of leaving it too late before making our protest.

"At the risk of hurting the feelings of some people, it is necessary to speak plainly about the events which led up to the present Agreement. When the original five clubs first started, it was with the aid of a grant of two machines and £1,000 a year each. Partly owing to the facts that the clubs had everything to learn and partly because they tried to provide flying too cheaply, they found it quite impossible to make ends meet on this basis. The Lancashire Aero Club, for example, lost £1,350 in its first two years of operation. Realising the value of the clubs, the Government then decided to extend the scheme and to increase the grant. For the next three years the grant was at the rate of £50 per new licence, £10 for old licences renewed, and 30s. per flying hour, up to a maximum of £2,000 per annum per club.

"On this basis, aided by several generous donations and successful air pageants, we succeeded in making a better show, and by the end of the three years we had wiped out our debit balance and seemed to be on the high road to financial security. Unfortunately, however, at this moment a new factor came into the scheme of things which upset all the existing arrangements.

"Certain gentlemen came forward with a scheme for the organisation upon a commercial basis of a chain of flying clubs and aerodromes throughout the country. They submitted estimates to show that they could not only do this upon a fraction of the subsidy then being given to the existing clubs, but could also make a substantial trading profit into the bargain. The associated clubs, having had some years of experience by this time, examined the figures and reported, with perhaps more forbearance than the occasion warranted, that they were not strictly in agreement with them. The Government of the day, however, accepted the estimates and granted the subsidy asked for upon condition that it was only to become payable upon the completion of the chain of aerodromes and landing grounds (nearly one hundred in number) as advertised by the promoters. It was obvious that if the estimates were correct, the Light Aeroplane Clubs must be about the least efficient organisations ever known, or that, if they were efficient, then the estimates must be totally inaccurate. Perhaps one can hardly blame the Government for seeking to save money by accepting the first alternative. The natural result was, of course, that when the existing club agreements had expired, they were renewed upon the same terms as those granted to N.F.S., namely, £10 per licence. Even at that, great difficulty was experienced in getting them renewed at all.

"What the associated clubs foresaw has come to pass. With the greatest appreciation of the efforts now being put forward by N.F.S. and of the individuals now responsible for its management, it cannot be said that the promises made have been fulfilled. Indeed, it seems probable that the very people now responsible for N.F.S. regret most keenly the promises made by their predecessors. It is true that they have accomplished something, but they are still a very long way short of the chain of aerodromes and flying clubs that we were to see on all sides, while the value of their shares in the market speaks for itself as an indication of their trading results.

"Meanwhile, the associated clubs, crippled financially by the drastic reduction of grants, and fighting an acute period of trade depression, are in little better shape. Some of them, like ourselves, have managed to put a little bit by to reserve and are now living on their capital.

Others are gradually piling up bank overdrafts. Few, if any of them, can see their way to make both ends meet.

"When the present agreement was entered into, three serious objections to it were raised by the clubs. In the first place, it was insufficient in amount; in the second place, it was insufficient in length of time; and in the third place, it was based upon licences only, instead of on both licences and flying hours. The same three objections are just as true now as they were then, but can perhaps be raised with greater force now in view of the experience of the last two years.

"To take them in reverse order, any subsidy dependent either upon licences or upon flying hours alone is too much influenced by local conditions. Where it is based upon licences alone, it has the additional disadvantage that it provides a direct incentive to the neglect of secondary training after a pilot has obtained his 'A' licence, both in the shape of advanced dual and in the shape of adequate flying practice.

"The period of the agreement is almost as important. In framing a programme, it is very important for a club to be able to budget several years ahead. An agreement for one, two or three years gives no adequate opportunity for this, and to be of the utmost value the agreement should extend for at least five or preferably ten years, subject, of course, to the satisfactory organisation of the club during that period.

"Lastly, as regards amount, the D.C.A. admitted that light aeroplane flying costs £2 15s. per hour, and that experience has shown £2 per hour to be the maximum which the clubs can hope to get from their members. This leaves a gap of 15s. per hour, and in our own experience and the experience of several other clubs the gap is in fact even wider, frequently approaching, and in some cases exceeding, £1 per hour. It is obvious that this gap cannot be bridged by subscriptions alone, while it is equally obvious that the present subsidy does not fill more than one-third of it at the outside in the great majority of cases.

"Some clubs are able to reduce the gap by the profits from air pageants, but it is not every club whose aerodrome is suitable for this purpose, and in any case the day of the flying pageant as a means of making profits is largely over so far as the clubs are concerned. Others provide more or less extensive social facilities, but while these are useful as a means of increasing the membership, they are not directly profitable as a rule owing to the 'seasonal' and 'week-end' nature of the clubs' activities. The plain truth is that it is not possible to bridge the gap under existing circumstances to such an extent as will give the clubs a reasonable chance of carrying on upon a permanent basis.

"When the clubs first started, it was thought that the cost of light aeroplane flying would show a progressive downward tendency. Unfortunately, the increase in horsepower and the recent petrol tax have combined to upset this calculation, and the plain fact is that it costs just about as much to run a light aeroplane to-day as it did five years ago—albeit the aeroplane is a considerably better

"If I were Chancellor of the Exchequer."

"It is fashionable at the moment to announce, either in print or on the wireless, what one would do if placed in unlikely positions of supreme power, such as Dictator of the World or Chairman of the Manchester Airport Committee. We may be forgiven, therefore, for saying what we would do if it lay in our power to dictate the terms of the new agreement to be entered into between the Government and the Clubs.

"In the first place, we should decide how many Clubs were necessary in the National interests and how many we could afford to support. We should then require every Club to submit its records up to date and should select the best Clubs up to the fixed number.

"We should then enter into an agreement with each of these Clubs for a period of ten years, but with the following safeguards as to termination: At the end of each year of the agreement the number of new and renewed licences gained by each Club during the year would be added up, each Club getting two points for each new licence and one point for each renewed licence, with a further one point for every twenty-five hours' Club flying carried out during the year. The points would then be

added up and the two (or more) Clubs which were at the bottom of the list would be liable to lose their places to any non-subsidised Club which could show a better record during the preceding year. This would ensure that any inefficient Club would lose its subsidy if there was any more efficient Club ready and willing to earn it. As a further safeguard, we would reserve the right to cancel the agreement automatically, if we thought fit, in the case of any Club which failed to earn a minimum of 100 points during the year.

"As new aerodromes are one of the vital necessities in connection with aviation, we would give an aerodrome grant of £100 per annum to every Club which either owned its aerodrome or could prove that it was paying more than this amount in rent.

"The grant for new licences would be £25, and for renewed licences £10 (half the ordinary year's grant).

AIRPORT NEWS CROYDON

MANY of us envied the various staffs of the foreign air lines, over the week-end, who cancelled their services for the New Year's celebrations. Operations were suspended on January 1, 2 and 3, and the only services at work were those of Imperial Airways. Ninety per cent. of us would probably have welcomed a few extra hours' sleep on New Year's Day, after the festivities of the previous evening, and it made us envy the luckier ones employed by the foreign companies.

The last of the Handley Page 42's, *Helena* by name, has been delivered, and is likely to be placed on service during the coming week.

Mr. Perry, on "Argosy" G-AAEJ, has now left Malta for Cairo, and Mr. Spafford, on *Hannibal*, is also en route for Cairo with the last of the Eastern type Handley Page 42's.

Lady Bailey has been at the aerodrome on several evenings, hoping to complete her "B" licence tests; but the weather has been against her, and she still has her night-flying test to do. It is rather unfortunate, for it is presumed she will now have to pass out under the new regulations which came into operation on January 1, and will therefore have to fly to Lympne instead of Penshurst.

Many people from the aerodrome saw the New Year in at the Aerodrome Hotel, where a dinner and dance was held. Quite a number of pale faces appeared on the first day of the New Year.

Looking back over the past year, with all its trials and tribulations, although traffic has not beaten any records, I think it is safe to assume that steady progress has been made. In previous years a large number of Americans have been using the air lines, but last year they were in the minority. Even so, traffic remained at a fairly high percentage. This high level without American tourist traffic to boost it up is a splendid omen, for it proves that the European is using his air lines as a regular means of transport, and not only as a means of luxury travel. Had

"A maintenance grant of 15s. per hour would be allowed in respect of all Club flying on Club aircraft, excluding any commercial flying which the Club might see fit to carry out. (This is also half the old grant.)

"In conclusion, the maximum subsidy for any one Club during the year would be £2,000 per annum, as at present.

"Assuming that twenty-five Clubs were selected, this would cost the country a maximum of £50,000 per annum, or exactly the same amount as was recently allocated to Grand Opera.

It would also have the effect of promoting a healthy rivalry with increased efficiency among the Clubs, and the 'league' system would give every encouragement to new Clubs to commence operations, but only in positions and under circumstances which give them a hope of qualifying for the league, or doing without a subsidy."

there been the usual American influx, I doubt very much if the air lines could have handled the rush. This is most encouraging, as regular passengers are wanted the most; seasonal traffic is not the kind to establish regular air lines, but, at the same time, it is to be hoped that when the passengers flock by the air lines again the companies will be able to deal with them.

Now that the new duties on imported goods are in force all companies will probably drop in their freight receipts. The Royal Dutch Air Lines have been very busy bringing in loads of flowers, etc.; the new duties for these came in on Monday evening.

We all hope that 1932 will see greatly increased business, with everyone showing a good turnover at the end of the year.

The traffic figures for the week were:—Passengers, 359; freight, 39 tons.
P. B.

Imperial Airways' Desoutter

WE have received the following communication from Imperial Airways, Ltd., regarding a statement made by "P. B." in last week's Croydon Notes:—

"I fear that your correspondent 'P. B.' has made an error in the 'Airport News' of the current issue of your journal. He states that 'Imperial Airways have bought a Desoutter to replace the old D.H. 50, for special charter work. This Desoutter is the machine which has up to this transfer belonged to the British Red Cross Society, and could often be seen about the country.' This statement is not correct, I fear.

"This Company has not bought the machine, but, while it is to remain the property of the British Red Cross Society, it has been taken over by us for the purpose of maintenance, in return for which we shall be able to use it for special charters. I should be greatly obliged if you would be so kind as to correct the erroneous paragraph in your forthcoming issue."

The Anglo-Egyptian Aviation Company

WHEN the Egyptian Parliament was opened on December 17, 1931, it was announced that formal approval had been given for the formation of an Anglo-Egyptian Company to undertake civil aviation enterprises in Egypt. This Company will be known as the Société Anonyme Misr-Airwork, and the capital for it will be jointly subscribed by the Banque Misr and Airwork, Ltd. Wide powers are vested in this company under the authorisation, and they will be empowered to undertake the establishment and operation within Egyptian territorial limits of civil flying training schools; local passenger-carrying flights; service stations; housing, provisioning, maintenance and repair of civil aircraft; aerial photography and survey; as well as regular and occasional civil air transport services for carrying passengers, mails and goods. Mr. Alan Muntz, the managing director of Airwork, Ltd., is leaving England again shortly to confer with the authorities of the Banque Misr, and it is hoped that the Company will be formed in time to commence operations in the near future. Under the agreement with the Banque Misr preference will be given

to British aircraft. The flying school is to be opened at Almaza Aerodrome and most probably four aircraft will be sent out for this purpose. Two "Puss Moths" will also be used for taxi work, and several machines will be available for sale. This enterprise is, in all probability, the first occasion upon which English and Egyptian interests have been combined within an Egyptian National Co. Thus once again we see the exceptionally far-sighted and able manner in which Airwork is being run; not only have they established the great commercial airport in England at Heston, but they also run the service and repair depôt at Bristol airport, whilst negotiations are, we understand, in progress for them to undertake similar work in other parts of the country.

Avro 10 Monoplanes for Egypt

Two Avro 10 monoplanes, originally intended for the Indian Government, have been sold by Airwork, Ltd., to the Egyptian Government, and are being fitted with wireless equipment at Woodford Aerodrome prior to being flown out to Egypt.



AIR TRANSPORT



THE LETOV S.32: Three-quarter front view of a new Czechoslovak all-metal commercial monoplane. It has three 140 h.p. Walter "Mars" engines.

LETOV S.32

A Czechoslovak 3-Engined Monoplane

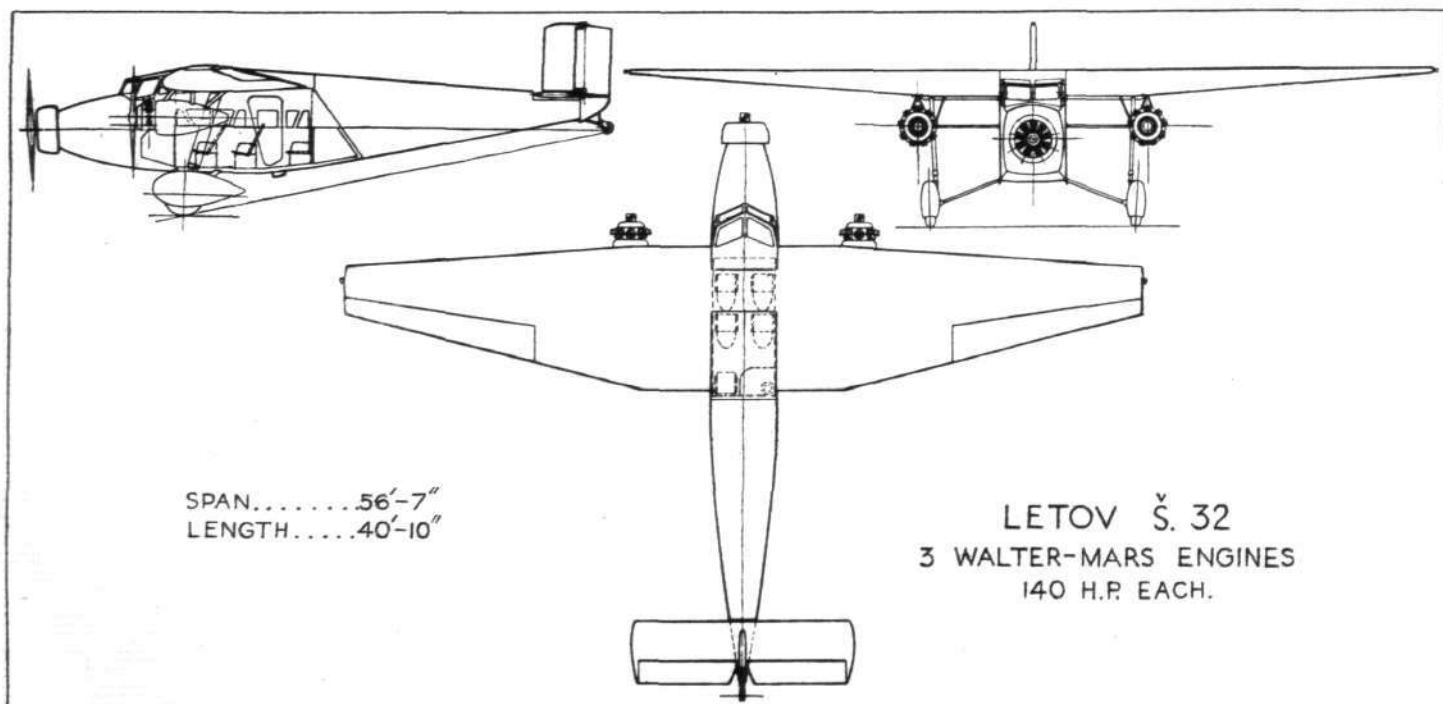
IN common with air transport concerns of other countries, Czechoslovakia has found that multi-engined machines are essential for the economical and safe operation of air lines where the volume of traffic and the distances covered are normally important. A little while back the Military Aircraft Works (Letov) of Praha—a firm which has hitherto concentrated on the production of military aircraft—were asked to produce a 3-engined commercial machine carrying four to six passengers, primarily for use on the night service route Praha-Bratislava-Uzhorod-Bucharest. This route lies almost entirely over mountainous country, and there was therefore a demand for a machine that could fly at high altitudes possessing at the same time a quick take off, good climb at normal speed, and a low landing speed.

In response, the S.32, shown in the accompanying illustration, was constructed, incorporating the latest modern improvements in aircraft design. It is a 3-engined cantilever monoplane of all-metal construction with the excep-

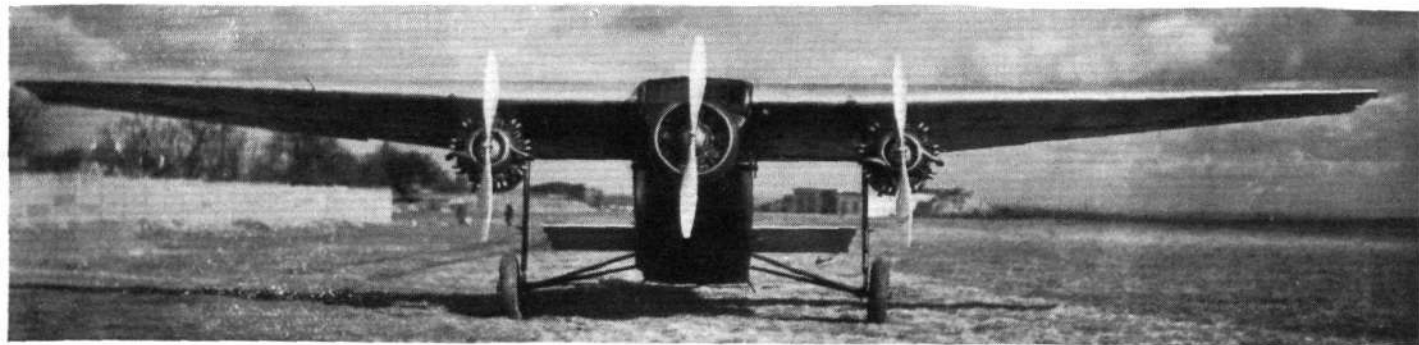
tion of the rear part of the fuselage and the tailplane, which are fabric-covered. The fuselage is constructed of steel tubes and duralumin, which are secured by bolts—no welding being employed.

The cabin is particularly roomy and lofty, so that passengers can move about freely. The ventilation is good, but not draughty, and doors are fitted on both sides of the cabin, with a safety door in the roof. Room for luggage is provided both in front and at the rear of the cabin, and between the central engine and the pilot's cockpit is a fireproof wall.

Comfortable seats with removable cushions for four or six passengers are fitted and large side Triplex windows provide an unobstructed view. The walls inside the cabin are in imitation leather, between which and the outer metal wall of the fuselage is inserted a soundproof material to reduce the noise of the engines. Racks for light luggage are provided above the seats, while fire extinguishers and various instruments are also fitted in



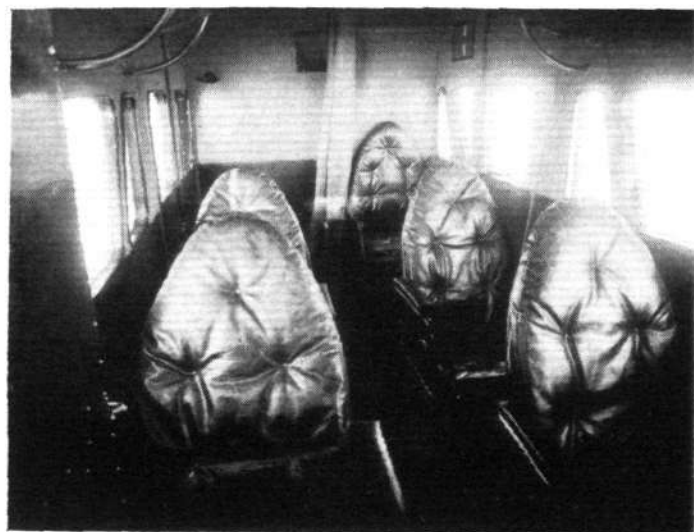
THE LETOV S.32: General arrangement drawings.



THE LETOV S.32: This front view shows the wide undercarriage.

the cabin. At the rear of the latter is the lavatory and space for luggage—but if this is not required the space can be utilised for extra passengers.

The pilot's cockpit is located at the leading edge of the wing, where he has a good view forward, sideways and upward. In the event of a crash, the pilot has easy means



An interior view of the cabin of the Letov S.32

of escape by way of the doors communicating with the cabin; it may be mentioned that a window is provided between the pilot's cockpit and the cabin, so that the occupants of both can see each other.

The cantilever wing is entirely covered with duralumin, and is built up in three separate parts round a central box spar, the leading and trailing portions being easily dismantled, to facilitate transport. The tail surfaces, as previously stated, are fabric covered, and the rudder is balanced. All controls are inside the fuselage, being very accessible, and the tail plane can be adjusted during flight.

Three Walter "Mars" engines, of 140 h.p. each, are fitted, one in the nose of the fuselage and two under the leading edge of the wing. The special engine mountings allow of the easy removal of the engines, while detachable cowlings provide easy adjustment. The petrol tanks are placed in the wings, some distance from the fuselage, and all three engines can be fed from either of these tanks; the feed is by gravity, and flexible "Superflexit" tubing is employed. "Letov" metal airscrews, with adjustable blades, are fitted.

The undercarriage is of the non-axle type, having a wide track and fitted with Messier Oleo-pneumatic shock absorbers. The 900 x 200-mm. Palmer wheels are provided with brakes. A tail wheel, with a movement of 30 deg., is fitted instead of the ordinary skid.

The "S.32" complies with the requirements as to factors of safety as laid down by the National Commission for Aeronautics.

THE AIR MAIL TO SOUTH AFRICA

FINAL preparations have now been made by Imperial Airways for the opening, on January 20, of their regular weekly air-mail service from London to Capetown. The first sections of the route, from this country to Kenya Colony, have been in operation since March last, and have proved already of great utility in the rapid transport of mails and passengers to and from Central Africa, while the final sections, from Kenya to the Cape, have now been organised completely in respect of the establishment of main aerodromes, intermediate alighting-grounds, wireless equipment, weather reporting stations, and rest-houses for passengers.

The first machine on the regular weekly service to Capetown will leave Croydon at 12.30 p.m. on January 20, and the mails are due in Capetown 11 days later, on Sunday, January 31. During the first month of operation mails only will be carried, but after this the route will be available for passengers, the through air fare from London to Capetown being £130.

The weekly service from Capetown to London was originally scheduled to leave Capetown each Monday, but in deference to the wishes of the Postmaster-General of the Union of South Africa—who considers that it would

be advisable to allow more time to reply to letters arriving by the in-coming mail each Sunday—Imperial Airways have now arranged to retard the time of departure from Capetown from Monday to Wednesday. The first London-bound service will, therefore, leave Capetown on January 27.

Below is a time-table, as finally arranged, of the various stages of the weekly England-South Africa air mail in each direction:—

FROM LONDON			FROM CAPETOWN		
London	.. dep.	Wed.	Capetown	.. dep.	Wed.
Cairo	.. arr.	Sat.	Johannesburg	.. arr.	Wed.
Khartoum	Mon.	Salisbury	Thurs.
Juba	Tues.	Mbeya	Fri.
Nairobi	Wed.	Nairobi	Sat.
Mbeya	Thurs.	Juba	Sun.
Salisbury	Fri.	Khartoum	Mon.
Johannesburg	Sat.	Cairo	Wed.
Capetown	Sun.	London	Sun.

Imperial Airways have issued special souvenir envelopes for use on the opening flights of this through service to the Cape, and these may be obtained from Imperial Airways, Ltd., Airway Terminus, Victoria Station, S.W.1, price 1d. each.

"This statement must be categorically denied. The truth is that the Franco-German Co-operation Committee, which was set up after the recent understanding between the two Governments, is now at work. It has set up a Transport Committee, which has been instructed, among other tasks, to find means of collaboration, by which the French and German air lines could be made to work more effectively without the formation of any trust or monopoly. This committee held its first meeting in Paris a

French and German Air Lines

THE French Air Ministry issued the following statement on January 4:—

"It has been stated that negotiations have been opened for the formation of a Franco-German trust under the direction of Dr. Eckener and M. Latécoère, which would control a system of air lines to the exclusion of Great Britain and Italy. It has been alleged that the French Government has approached certain French banks with a view to financing such an organisation.

month ago; it is holding its second meeting in Berlin this week.

"The British and Italian Governments are not unaware that the French Government is ready to make agreements with them similar to those which are now being discussed. These agreements are not aimed against any other party."

The Franco-German Committee alluded to in the above includes Dr. Weigelt, of the Deutsche Bank, M. Dautry, General Director of French State Railways, and members of both Government Air Departments. Herr Wronsky, Director of the Deutsche Luft Hansa, and Dr. Eckener, of the Zeppelin Company, are also expected to take part. It is hoped to come to arrangements for eliminating wasteful competition on the routes to Turkey and the Balkans, and also on the South American route. The use of the airship *Graf Zeppelin* on the latter route may be discussed. At present the Germans send mail by air to the Canaries, thence by steamer to Fernando Noronha, where it is carried by air to Brazil. The French carry theirs from Dakar to Brazil by fast despatch boats, but use aircraft over the land at both ends of the Atlantic crossing.

The Indian Air Mail Services

WITH the departure of last week's homeward air mail from Delhi, the contract between Imperial Airways and the Indian Post Office for the conveyance of mails between Delhi and Karachi came to an end. From now the mails will be carried between these two points under contract between the Post Office and the Delhi Flying Club. The Club received from the Government a "Gipsy II Moth," and in return has undertaken to convey a weekly mail each way of an average of 60 lb. from Delhi and 80 lb. from Karachi. It is further reported that the Government has also completed, subject to confirmation by the Standing Finance Committee of the Legislative Assembly, an arrangement with Messrs. Tata, of Bombay, for a weekly air mail between Karachi, Bombay and Madras. Messrs. Tata will bear the whole financial risk of the service, which, at the outset, will not pay. It is expected, however, that this mail will rapidly increase to the paying level, and it is hoped to start the service in April with a D.H. "Puss Moth."

Imperial Airways' Alternative Route across Kent

THE usual route for aeroplanes making from Croydon to the Continent is via Sevenoaks to Lympne, and at Penshurst, near Tonbridge, there is an emergency landing ground equipped for night flying. It is proposed to prepare an alternative route somewhat to the west of the one mentioned. There is a landing ground at Littlestone, a few miles south-west of Lympne, which is often clear of fog when Lympne on the top of the cliffs is quite enveloped. A new landing ground in the vicinity of Reigate and

Redhill is being sought, but may not be too easy to find in such hilly surroundings.

Australian "Xmas Air Mail"

REPAIRS having been completed to the Australian National Airways' Avro 10 *Southern Star* at the Hamble works of A. V. Roe, Ltd., all was in readiness for the scheduled start for Australia on January 6. In order to save time it was decided to take off direct from Hamble, where the mail—which meanwhile has increased slightly in bulk, being now about 650 lb.—was previously transferred. Air Commodore Kingsford Smith and Mr. G. U. Allen are piloting the *Southern Star*, and Mr. F. G. Taylor, of A. V. Roe, Ltd., is accompanying them as engineer. It is hoped to reach Darwin on January 16 and Melbourne three days later. At the time of writing bad weather had held up the departure from Hamble, and they were awaiting favourable weather reports.

Faster Air Services in Germany?

A PROPOSED increase of 75 per cent. in the speed of passenger air traffic in Germany is reported from Berlin, and to this end in view a fleet of new airliners, designed by Drs. Stoffel and Schatzky, Luft Hansa engineers, and having a maximum speed of 220 m.p.h. and a cruising speed of 190 m.p.h., will be put into service next summer. These machines will have three engines of 500 h.p. each, and will carry six passengers and two pilots.

And in France—

FRANCE also proposes to speed up her air lines, for it is reported that the French Air Union will, during the present year, place on the London-Continental services new machines having a maximum speed of 160 m.p.h. and a cruising speed of 137 m.p.h., which will be able to accomplish the journey between Paris and London in about 1 hr. 40 min.

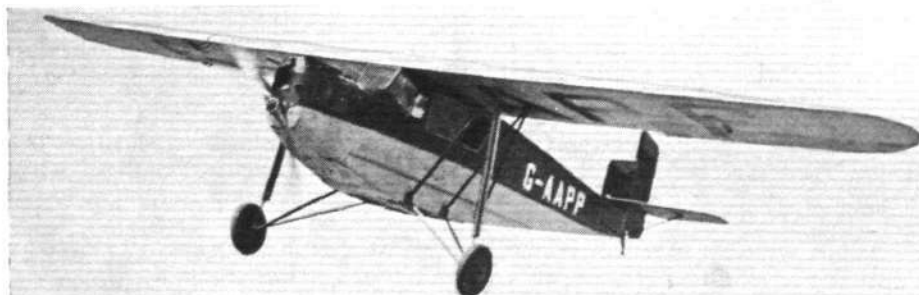
—And Holland

THE K.L.M. (Royal Dutch Air Lines) are also, it is stated, going to put faster machines on their air lines.

Transatlantic Air Mails

DISCUSSIONS took place in Paris on December 28 regarding France's position in the organisation of a Transatlantic air mail service between Britain and America. The problem has been under consideration in Britain, France and America for some time, and negotiations have already been instituted between Imperial Airways of Britain, the Aeropostale of France, and Pan-American Airways for a pooling of resources and concessions on an air route from London via France and the Azores and Bermuda to New York. All three countries have also been considering the problem of large flying boats capable of operating over the Atlantic.

THE "SPARTAN CIRCUS" IN AFRICA: Three "snaps" from the Cape taken on the occasion when the Circus (which is composed of Mr. Oscar Garden, Capt. E. D. Ayre, J. King, E. D. Cummings, Mr. John Trantum and Mr. C. E. F. Reilly) now touring Africa, visited the Cape Town Airport. The upper picture shows John Trantum, with revolver, as aerial cowboy astride the "Spartan." Below (left), Capt. King giving joy-rides in the Desoutter, and (right), one of the three "Hermes-Spartans" belonging to the Circus.



AIRISMS FROM THE FOUR WINDS

R.A.F. East African Flight

IN our last issue we gave some facts about the flight to East Africa which is to be undertaken by No. 14 (Bomber) Squadron, with Flt. Lt. R. L. R. Atcherley in command of the flight. We understand that this is not in substitution for the flight to the Cape, but as that route has now been opened to commercial aircraft, the pioneer work of the R.A.F. is held to be finished. That is not to say, however, that future flights to the Cape may not be undertaken by the R.A.F. if it is thought advisable. The East African flight starts from Heliopolis next Monday, January 11, with a flight of 670 miles to Wadi Halfa and stops for refuelling at Assiut and Aswan. The route then is:—January 12, Khartoum, 531 miles, refuelling at Atbara; 14th, Malakal, 438, refuelling at Kosti; 15th, Juba, 360; 16th, Entebbe, 370, where co-operation with the King's African Rifles will be carried out for four days. January 21, Jinja, 60 miles; 24th, Kisumu, 115; 26th, Nairobi, 150, stay for 14 days, visiting El Doret, Naivasha, Nakuru, Nanyuki, carrying out Army co-operation at Nairobi and Meru. February 10, Mombassa, 270; 14th, Moshi, 180; 16th, Kondoa-Irangi, 140; 18th, Dodoma, 100; 20th, Dar-es-Salaam, 260, waiting four days for co-operation; 25th, Lindi, 240; 27th, Dar-es-Salaam, 240; 29th, Zanzibar, 50. March 2, Dodoma, 310; 4th, M'Beya, 250; 6th, Tabora, 335, waiting four days for co-operation; 11th, M'Wanza, 175; 13th, Nairobi, 300; 22nd, Tororo, 240; 24th, Juba, 380, refuelling at Nimule; 26th, Khartoum, 760, refuelling at Malakal and Kosti; 27th, Luxor, 827, refuelling at Atbara and Wadi Halfa; 29th, Heliopolis, 364 miles, refuelling at Assiut.

The Long-Distance Record Attempt

WE understand that the Fairey-Napier long-range monoplane will not start on the attempt to fly non-stop to Capetown until the full moon in February. After the crash on its return to England from Egypt, it was thought advisable to overhaul certain details of the machine, and, though the machine might have been got ready in time for the January full moon, there is no reason to hurry matters.

England-Algiers Non-Stop

A MAGNIFICENT non-stop flight—which, incidentally, was shrouded in a certain amount of mystery—was accomplished by Flt. Lt. E. H. Fielden, the Prince of Wales' pilot, last week. Flying a D.H. "Puss Moth" ("Gipsy III") fitted with extra fuel tanks for the Shell spirit and oil, Flt. Lt. Fielden set out from Hayes at 5.25 a.m. on December 29 and some 11 hours later landed at Algiers. He had thus flown over 1,000 miles at an average speed of about 100 m.p.h. Next morning he flew on to Cairo. Actually, Algiers was not the final destination, but weather and other circumstances did not permit!

Mollison Still in Trouble

MR. J. A. MOLLISON, returning from Egypt after his unsuccessful attempt on the England-Australia record, is still experiencing trouble. After his forced landing at Mallersdorf, when he damaged his airscrew, he was again forced down, by bad weather, near Straubing, Bavaria, on December 30, and ran into a ditch. One report stated that a helper had his arm cut off by the airscrew, but Mollison himself was unhurt.

Paris-Indo China Non-Stop Attempt

THE French pilots, Codos and Robida, left Le Bourget on January 4 in a new Breguet 27 in an attempt to reach Hanoi non-stop.

T. O. M. Sopwith buys "Shamrock V"

MR. T. O. M. SOPWITH, who, as most of our readers know, is an enthusiastic and successful yachtsman, has recently acquired the late Sir Thomas Lipton's last America's Cup challenger, *Shamrock V*. Great things are expected this summer from *Shamrock V* with its new owner at the helm.

Andorra Republic's Air Service

THE tiny Republic of Andorra, in the Pyrenees, is planning a regular air service to Spain. They will probably start with an issue of special air mail stamps!

Prince Bourbon's Expedition

PRINCE SIXTE OF BOURBON and the members of his scientific expedition left Marseilles by air for Tunis on December 29. The object of this expedition is to cross the Sahara to Lake Chad in order to explore Wadai, oases hitherto not reached by motor cars, and to collect geographical, geological and zoological data.

The "Akron" to Visit England?

It is rumoured that the U.S. Navy airship *Akron* may, in the course of its series of long cruises to be carried out this year, pay a visit to England.

Wigram Aerodrome (N.Z.) Enlarged

SIR HENRY WIGRAM, who some years ago gave £10,000 for the New Zealand Government to acquire Wigram Aerodrome, Christchurch, has given 81 acres of land adjoining the aerodrome, which now consists of 209 acres.

Aircraft Quell Rising

THE appearance of aircraft over the affected area has been the means of quelling a rising in the Argentine.

French Pilots Crash

WHILE taking off from Oran, Algeria, on December 29, for an attempt on the world long-distance record, M. Mermoz and M. Mailloux crashed in their machine, which failed to rise; they were uninjured. Another well-known French pilot, Jean de Viscaya, was killed while attempting a similar record, for light seaplanes, at Masmejean, on December 18.

Balloon Record Attempt

ON December 30 last, at 11.30 p.m., Mme. Weber ascended in a balloon from the Aeroclub grounds at St. Cloud for an attempt to win the Melchoic Cup for the longest straight-line flight for balloons. She landed near Dijon at 11 a.m. the following morning.

An Annual Reunion

ON Saturday, January 23, the Old Comrades Association of the R.N. Seaplane Base, Port Said, Egypt, will hold its Tenth Annual Reunion Dinner. During the Great War famous seaplane carriers were attached to this base, including the *Ben-my-Chree* (the famous Isle of Man steamer), the *Empress* (now on the regular cross-Channel service between Folkestone, Dover and Calais), the *Raven II*, the *Anne* (both steamers captured and renamed), and the *City of Oxford*, an old tramp taken over from the City Line and reconditioned as a seaplane carrier. All officers and men who are interested are invited to communicate with the Hon. Secretary, Mr. Norman M. Williams, 16, Shrewsbury Avenue, East Sheen, London, S.W.14 (Telephone No.: Prospect 4830).

The de Havilland Aeronautical Technical School Third Annual Ball

A VERY great success is expected for the third annual ball of the D.H. Aeronautical Technical School which is being held at the Portman Rooms, Baker Street, at 8 p.m. on Friday, January 15. There will be a continuous buffet organised by Harrods, Ltd., at which bacon and eggs will be served from midnight until 2.30 a.m. in order to ensure that none of those present need return home hungry. The dance music will be produced by Mr. Newman and his band. A large number of aeronautical celebrities are expected to be present, including Col. F. C. Shelmerdine, the Director of Civil Aviation, and Col. H. W. Outram, Director of the Aeronautical Inspection Directorate, as well as many members of the Air Ministry and Government educational authorities. Prizes for novelty dances will be presented at midnight. The increasing support which has been given to this function is a very gratifying feature of the recognition the school has received. It is the pioneer civil aeronautical technical school in the world, and its activities have been officially recognised by the Air Council, Board of Education and Middlesex Education Committee. Owing to this support nearly all the allotted number of tickets have been sold, and those who are desirous of coming should apply at once to the Dance Secretary of the D.H. Technical School, Stag Lane, Edgware, Middlesex.



THE INDUSTRY



AIRCRAFT RADIO

STANDARD Telephones & Cables, Ltd., of Connaught House, Aldwych, W.C.2, are responsible for the installation which is being used for the Automobile Association weather broadcasting scheme at Heston Airport. The installation of this equipment is yet further evidence of the practical way in which the proprietors of Heston Airport are determined to make their aerodrome one of the most up to date in the country, for it is an undoubted fact that the provision of a radio station at every municipal airport will not only increase the safety and regularity of aerial traffic in general, but will automatically tend to increase the volume of that traffic. It follows, therefore, that radio stations must in the end be very profitable investments.

The range of equipment which Standard Telephones & Cables are producing for aircraft and airport use is such as will meet all possible requirements. The transmitter for the ground station is of the type known as M.4. The whole equipment is operated from the electric mains, and is designed so that both the operation and upkeep are remarkably simple. Its range for telephony is something over 250 miles, while for telegraphy it is considerably more.

The chief reasons for the installation of such a station as at Heston are:— (1) Communication with aircraft in flight; (2) communication with neighbouring aerodromes; (3) transmission of weather reports and forecasts for general use in aviation. The receiver of this ground station is type R.S.1, and can receive on wave lengths between 40 and 20,000 metres, a particular feature being that it is not necessary to change coils for different wave lengths, as this is carried out by means of plugs and sockets. In the aircraft a set such as the standard M.S.3044 is used. This can receive messages up to 100 miles from an M.4 ground station without the necessity of a trailing aerial. This particular receiver is suitable for even the smallest type of aircraft. The fixed aerial is mounted between the wing tips and tail, and folds without inter-

ference when the wings are folded. Its wave range is 600-1,000 metres, and its controls are confined to a single switch and one tuning dial. The possession of such a set, therefore, makes it a simple matter for pilots to obtain weather reports and other information which is helpful on cross-country flights.

A further use which it is quite conceivable may become very popular in the near future, is for advising and instructing pupils during their solo flights; the instructor can then sit with the microphone in front of him in the control tower and order his pupil to do anything or not to do anything, by means of the wireless. This receiver is particularly small, its overall dimensions being $9\frac{1}{2}$ in. \times $4\frac{1}{2}$ in. \times $4\frac{1}{2}$ in., and its weight only 4 lb. 10 oz. Particular care has been taken to protect this receiver from damage due to knocking about, and there is one case on record where the aircraft was involved in a crash and was completely written off, but on inspection the radio receiver was found to be perfectly intact and in working order. For the technically minded, it is interesting to note that the circuit comprises two screen-grid high-frequency valves preceding a detector valve and transformer coupled low-frequency amplifier with special output. A wander plug and screened multi-cord cable connect the receiver with the battery box, while two terminals at the top of the set are connected to the aerial system and the metal work of the machine respectively. The voice pipe system is utilised for receiving, a small loud speaker movement being incorporated in the voice pipe line. By this means

full intercommunication is well maintained between the pilot and his passenger, while at the same time both make use of the radio receiver. The valves used are ordinary commercial ones and may be purchased from any ordinary dealer. The battery box, which is made of aluminium, contains a small two-volt non-spillable solid electrolyte accumulator, 120-volt dry high-tension battery, and a small grid bias battery, all of which may also be replaced from any local dealer. The accumulator is such that it should in ordinary use be sufficient for somewhere about 25 flying hours before needing recharging. The high-tension battery with, the same usage, should last some $2\frac{1}{2}$ to 3 months, while the grid bias is of sufficient size for six or eight months' use. The aerial consists of a single insulated stranded wire running from each wing tip to the tail fin and from the centre of these wires a lead-in runs to an insulator on one of the centre-section struts, assuming the aircraft to be the conventional single biplane. All the aerial fittings are standard, and do not impair the airworthiness of the machine, for the whole of the installation is approved by the Air Ministry. One thing, however, is needful for the satisfactory functioning of this receiver, and that is the screen of ignition system. This means that the magnetos must be shielded, the high-tension cables screened with braided copper wire and the plugs with a cover such as that illustrated as suitable for Lodge Plugs in FLIGHT for December 25, 1931.

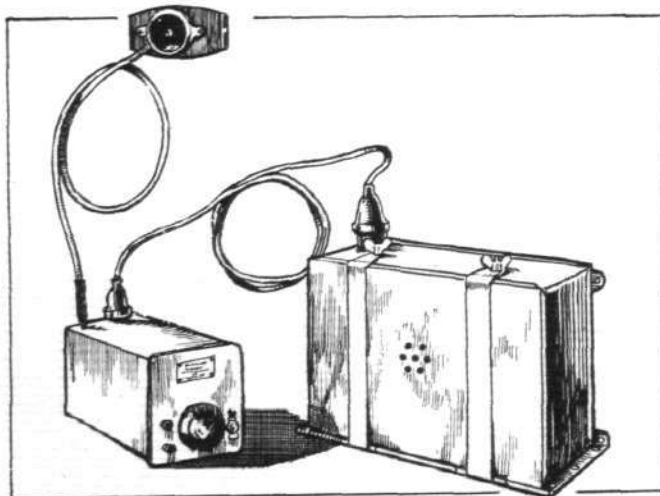
Such work can be carried out by the Standard depot at Heston Airport at a comparatively small charge,

(on right)

The Radio station at Heston equipped by Standard Telephones & Cables, Ltd., and run by the A.A. aviation weather reports department.

(on left)

Type M.S. 3044 receiving outfit. Receiver (left), Battery Box (right), Loud Speaker unit (above).



and it should be noted that without screening, satisfactory results cannot be expected. Agents of this firm also exist at Brooklands, Stag Lane and Hatfield, where orders can be expeditiously handled. Standard Telephones are also catering for any work in connection with aviation radio, and are always ready to provide equipment outside the standard ones. The advice of their experts will gladly be given without any obligation.



COMFORTABLE GOGGLES

GOGGLES round which the wind can leak, thus causing draughts between the glass and the eye, are always extremely uncomfortable. A recent type of Meyrowitz goggle has been produced to obviate this trouble. These goggles were designed in collaboration with the late Sir Henry Segrave, and besides the flat sorbo cushions, which, as may be seen from the illustration, fit the face in an admirable manner, they also have the Meyrowitz adjustable bridge, triplex glass lenses, with controlled ventilation and flat very wide angle lens. In the Meyrowitz Showroom at 1A, Old Bond Street, London, W.1, both this new pattern and many other patterns of goggles will be found.

Goggles are one of the things over which no pilot should stint himself, for an uncomfortable pair, or the lack of them due to blowing off at a critical moment, has been known to be the cause of losing more than one important race.

KE 965 SPECIAL VALVE STEEL

VALVE steel has necessarily demanded special attention with the high temperatures now obtained in internal-combustion engines, and that it has met the severe conditions imposed by high-performance aero engines is apparent in the air records of recent years.

Up to a certain temperature, say, 750 deg. C., many types of valve steel give satisfaction, but when that temperature is exceeded the number becomes restricted. Physical properties, such as scaling and erosion, which are not particularly noticeable at low temperatures, become prominent when valves are required to work in high

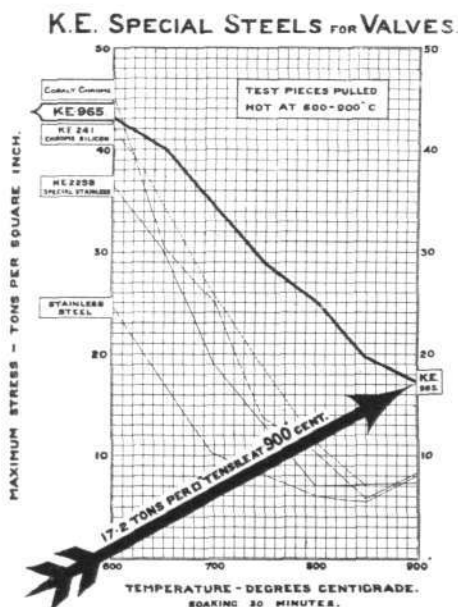
temperatures. At temperatures up to 600 deg. C., the resistance to oxidation is not a cause of trouble in the usual steels, but when a temperature of 900 deg. C. is approached then scaling is pronounced in many instances. With increasing temperature all steels exhibit a falling off in tensile strength, and it is a question of which kind of steel will give the greatest strength at the higher temperatures, and how long will the strength be maintained under those temperatures.

When a steel is under load during the time of heating its strength will gradually decrease, and steels giving a good tensile figure when tested for a short period at a given temperature will often prove comparatively weak after a much longer test in the same temperature. A valve steel which has proved its efficiency when working in high temperatures for long periods, is the KE 965 special steel, developed by Kayser, Ellison & Co., Ltd., Carlisle Steel Works, Sheffield.

KE 965 is an Austenitic nickel-chrome steel which does not air-harden under any conditions, and, therefore, does not become brittle.

It retains a high-tensile figure at the highest temperatures found in practice. From the chart KE 965's maximum stress at 900 deg. C., is seen to be 17.2 tons per sq. in. tensile, the figure being obtained while the test-pieces were actually being pulled hot in the furnace.

A five-hour heating test at 1,000 deg. C., showed the resistance of KE 965 to the erosive action of exhaust gases, as there was no apparent loss of weight. KE 965, assists in overcoming one of the root causes of engine trouble, by eliminating valve distortion, and, incidentally, distortion of the seating. Oxidation does not occur with this steel, and it forges and machines quite well. The heat-treatment is very simple, the valve forgings usually being supplied in the ready heat-treated conditions; the treatment consisting of normalising by heating to 900 deg. C. and cooling on the floor.



For ordinary purposes the valves require no further heat-treatment after

machining, but if they are for use in an engine which will be highly stressed, the manufacturers recommend a second normalising at the same temperature and cooling on the floor after rough machining and before final grinding and polishing. Turning or milling is not a difficulty with this high alloy if the tool angle is kept acute, and a trifling difficulty with drilling has been surmounted by the use of a short stubby drill, with a good backing off or cutting clearance at the cutting edge.



INDICATING CALIPERS

DIRECT reading calipers are of the greatest value in any branch of engineering, and those such as shown above, which are marketed by James W. Carr & Co., of 35, Queen Victoria Street, London, E.C.4, should prove a great time-saver. They have an opening capacity of 3 in., and the scale is marked either in $\frac{1}{2}$ mm. or 64ths. With ground gears, ball bearings, glass-hard ends, a spring to take up back-lash and stop for repetition work, these calipers are undoubtedly a first-class precision tool. They are of exceptional value when the thickness of the part which it is desired to measure lies inside another part where it is impossible to use an ordinary micrometer. A good example of this is the centre of a saucer, and the aircraft constructor will find that there are thousands of such places in an aircraft.

THE MENASCO B-4 "PIRATE"

AN extremely well 'got-up' handbook, compiled on the loose-leaf principle, has recently come to hand from Menasco Motors Inc., 6, 7 and 8, McKinley Avenue, Los Angeles, California. This is by way of being a service manual for the model B-4 95-h.p. four-cylinder inverted, in-line, air-cooled engine, and copies of this will be sent by the publishers on receipt of \$2.50. There are at present, as far as we are aware, no engines of this make in actual service in England, but no one who wishes to be thoroughly conversant with the workings and construction of this engine can afford to be without this book. A series of appendices describe the magneto, carburettors and starters in very great detail, while the profuse illustrative matter in the principal part should make it an easy matter to follow the text.

FILMS FROM THE AIR

MR. ROY TUCKETT, who will be well remembered as the pilot who took that remarkable film of Kilimanjaro and other parts of Kenya when flying solo in a Moth, is now founding a new Company under the name of British Air Travel Features, Ltd. This Company proposes to produce and distribute films which, as its name implies, will chiefly be concerned with the aerial aspect of things. Mr. Tuckett himself has shown by his work to date that he has a *flair* for cinematography, and he should therefore be able to exploit his skill to the full in this new enterprise. Those who are interested should get in touch with him at Kingswood, 31, Craven Hill Gardens, Lancaster Gate, W.2 (Telephone: Park 4409).

AN ANGLO APPOINTMENT

MR. E. E. SOUBRY, whose photograph (by Marian Lewis) is shown on the right, has been appointed General Sales Manager of the Anglo-American Oil Co., who are the proprietors of Pratt's High Test Petrol. Mr. Soubry seems to be a very exceptional man, for he is probably one of the youngest to hold such a high executive position in the British oil marketing field. He started his career as a junior in the Company's office at Queen Anne's Gate, Westminster, and then served throughout the war in the Royal Fusiliers. After the armistice he returned again to the Company, where his exceptional qualities rapidly



Mr. E. E. Soubry.

made themselves felt, bringing him promotion, first as Manager in the west of England, then to the post of Sales Manager at headquarters, and now to his new position. In view of the fact that the Company has over 8,000 British employees, the importance of his work must be of considerable magnitude.

AND A DENIAL

WE are able to deny officially the rumour that the Anglo-American Oil Co. has accepted an invitation

to join the Shell-Mex-B.P. merger. The Anglo-American Oil Co. has been established in Great Britain for over twelve years; they maintain twelve large refineries in England and Scotland; their fleet of British-built oil tankers numbers 135; they have 3,075 British motor vehicles, while some one-and-a-quarter million pounds per annum are required to pay the wages of their 8,000 employees.

ANOTHER FLYING SCHOOL

NEW flying schools are not so common as to have ceased to be matters of interest. One of the latest which will not only teach flying and offer a complete course of instruction and maintenance of machines, but also provide full facilities for joyriding in many of the seaside towns during the summer season, is that founded by Messrs. G. Rickard and E. Edmunds, called The Regent Flying Services. Their head office is situated at 17, Katherine Street, Croydon.

A SILVERTOWN CHANGE

MR. OWEN J. P. WRAY, who has been for over 26 years with Silvertown Lubricants, Ltd., of Minoca Wharf, West Silvertown, has been elected Chairman of his Company.

His co-directors are Messrs. C. A. Featherstone, J. Russell Knowles, W. Lee and Owen Colverd. These gentlemen have also been associated with Silvertown for many years.

Investigation of a Civil Air Accident

THE Inspector of Accidents has completed his investigation of the accident to an "Avian" aircraft which crashed at an air display at Cambridge on June 13 last. The aeroplane had been flown on the morning of the accident from Croydon to Brooklands and thence to Cambridge, and early in the afternoon the pilot made a test flight occupying about 15 minutes, during which he rehearsed the programme of aerobatics which he was to carry out later in the day. At the display, after a series of aerobatic manoeuvres, the pilot made a steep dive; the starboard wing structure broke up, and the machine fell to the ground. The aircraft was wrecked, and the pilot received fatal injuries. It appears from the Inspector's conclusions that the structural failure was primarily due to fracture of the ribs between the spars of one of the main planes, and that this failure occurred at a time when the aircraft was being subjected to high, but by no means abnormal, stresses. The Inspector also drew attention to the need for strengthening the wing structure of machines of the particular class of "Avian" aircraft affected, and the technical Press, the manufacturing industry, and all ground engineers and owners of aircraft were immediately notified to this effect. (See Notice to Aircraft Owners and Ground Engineers, No. 39, of 1931.)

The Dutch Air Mail Accident at Bangkok

THE Siamese Government committee which has been investigating the Dutch mail aeroplane crash at Bangkok on December 6—in which five persons were killed and Col. Brinsmead seriously injured—has found that the machine was improperly trimmed but not overloaded. In its opinion the emergency exit flap, which had been left open, increased the heaviness of the tail. This flap had been specially built in one of the wings at the request of the pilots, who opened it before the start because the cockpit was full of fumes from the engine.

Air Disarmament Discussed

PROFESSOR GILBERT MURRAY presided over the Anglo-French Students' Conference on Disarmament and Tariffs at the Students' Movement House, Russell Square, on December 29. He said that there were no material guaran-

tees against war from the air. He said that London and Paris could be destroyed but could not be defended. Even Germany, with no military aeroplanes, had enough commercial aeroplanes to destroy Paris with bombs. The first step to material security was the prohibition of military aeronautics and the internationalisation of commercial aircraft companies.

The Air Ministry Moving to Scotland Yard?

It is announced at Scotland Yard that Col. Maurice C. A. Drummond would shortly take up the post of personal assistant to Lord Trenchard, Commissioner of the Metropolitan Police. Col. Drummond has been A.Q.M.G., Eastern Command, and before that he was the Deputy-Director of Staff Duties at the Air Ministry. During the war he served with the Black Watch, and was wounded at the Marne.

"Flight" Postcards—New Series

A NEW series of FLIGHT postcards has just been completed and is now for sale. The postcards, which are original photographic prints and not reproductions, include machines of the Royal Flying Corps, the Royal Naval Air Service and the Royal Air Force. Single cards can be obtained from FLIGHT Offices, 36, Great Queen Street, London, W.C.2, at 6d. each, post free, or any six postcards from the series at 2s. post free. The present series include the following (arranged in alphabetical order) and others will be added from time to time: Armstrong Whitworth "Atlas"; Armstrong Whitworth "Siskin"; Blackburn "Iris"; Bristol Scout; B.E. 2C; Bristol Fighter; Bristol "Bulldog"; de Havilland D.H. 1; D.H. 2; D.H. 4; D.H. 5; D.H. 6; D.H. 9; D.H. 9A; Fairey "Flycatcher"; Fairey "Fox"; Fairey III.F; Handley Page 0/400; Handley Page "Hinaidi"; Henry Farman; Hawker "Fury"; Hawker "Horsley"; Hawker "Hart"; Gloster "Grebe"; Martinsyde F.4; Maurice Farman "Longhorn"; Maurice Farman "Short-horn"; Nieuport 1½ Plane; R.E. 8; Spad; Short 225; Sopwith "Dolphin"; Sopwith "Salamander"; Sopwith "Snipe"; Sopwith 1½-strutter; Sopwith "Camel"; Sopwith "Pup"; Vickers Gun Bus; Westland "Wapiti."

THE ROYAL AIR FORCE

HALF-YEARLY PROMOTIONS

The Air Ministry announces.—The undermentioned promotions are made with effect from January 1, 1932 :—

General Duties Branch

Air Vice-Marshal to be Air Marshal—Sir John Miles Steel, K.B.E., C.B., C.M.G.
Air Commodore to be Air Vice-Marshal—Norman Duckworth Kerr MacEwen, C.M.G., D.S.O.

Group Captains to be Air Commodores—Napier John Gill, C.B.E., M.C. James Bevan Bowen, O.B.E.

Wing Commanders to be Group Captains—William Sholto Douglas, M.C., D.F.C. Paul Copeland Maltby, D.S.O., A.F.C. Douglas Claude Strathern Evill, D.S.C., A.F.C. Trafford Leigh Leigh-Mallory, D.S.O. Richard Hallam Peck, O.B.E.

Squadron Leaders to be Wing Commanders—William, Sowrey, D.S.C., A.F.C. Eric Roby Vaisey. Richard Cecil Hardstaff. Claude Russell Cox, A.F.C. James Milne Robb, D.S.O., D.F.C. Harold Melsome Probyn, D.S.O. John Leacroft, M.C. William Hastings de Warrenne Waller, A.F.C. Leonard Horatio Slatter, O.B.E., D.S.C., D.F.C. Lionel Mundy Bailey, A.F.C. Siegfried Richards Watkins, A.F.C. Charles Edward Hastings Medhurst, O.B.E., M.C. Alan Lees, A.F.C. Augustus Henry Orlebar, A.F.C.

Flight Lieutenant to be Squadron Leader—Percy Edward Gwyer, M.B.E.

Flying Officers to be Flight Lieutenants—Frederick William Boggis. Ernest Richard Hockaday. George William Gay. Sidney Thomas Morgan, O.B.E. (Lt.-Commander. R.N.). Edwin Beadnell Carnduff (Lt. R.N.). Alec Alderson Murray (Lt. R.N.).

Accountant Branch

Flight Lieutenants to be Squadron Leaders—Frank Owen Hall. Charles William Rogers.

Medical Branch

Flight Lieutenants to be Honorary Squadron Leaders—Jack Garland Skeet, M.R.C.S., L.R.C.P. Arthur Wandesford Comber, M.R.C.S., L.R.C.P.

PRINCESS MARY'S ROYAL AIR FORCE NURSING SERVICE

Senior Sister (Acting Matron) to be Matron—Miss Winifred Maud Coulthurst.
Sister (Acting Senior Sister) to be Senior Sister—Miss Jessie Dorothy Jackson.

ROYAL AIR FORCE RESERVE

Reserve of Air Force Officers

Medical Branch

Flight Lieutenant to be Honorary Squadron Leader—Thomas Malcolm Walker, M.R.C.S. L.R.C.P.

London Gazette, January 1, 1932.

General Duties Branch

Air Commodore C. T. Maclean, D.S.O., M.C., is appointed Director of Postings, Air Ministry, vice Group Capt. F. K. Haskins, D.S.C., A.D.C. (December 28, 1931).

The follg. Pilot Officers are promoted to the rank of Flying Officer.—R. B. Lees (October 13, 1931); R. B. Brown (December 27, 1931). Flt.-Lt. C. R. Mason takes rank and precedence as if his appointment as Flt.-Lt. bore date January 1, 1931, immediately following Flt.-Lt. I. R. Grant on the graduation list. Reduction takes effect from October 15, 1931. Sqd.-Ldr. R. T. B. Houghton, A.F.C., is placed on half-pay list, Scale A, from December 13, 1931, to December 23, 1931, inclusive. Lt.-Com. F. M. R. Stephenson, R.N., Flt.-Lt., R.A.F., ceases to be attached to R.A.F. on return to Naval duty (December 28, 1931). F/O. H. C. Gammon is placed on retired list at his own request (December 18, 1931).

Stores Branch

Sqd.-Ldr. C. F. Rasmusen, O.B.E., is placed on retired list (December 29, 1931).

Dental Branch

E. Sharp, L.D.S., is granted a non-permanent commn. as Flying Officer with effect from and with seny. of December 14, 1931.

ROYAL AIR FORCE INTELLIGENCE

Appointments.—The following appointments in the Royal Air Force are notified :—

General Duties Branch

Wing Commanders: C. E. Maud, to H.Q., Coastal Area, for Air Staff duties, 19.12.31. P. C. Maltby, D.S.O., A.F.C. (since promoted to Group capt.), to Central Flying School, Wittering, pending taking command, 19.12.31. R. P. Willock, to H.Q. Fighting Area, Uxbridge, for Air Staff duties, 20.12.31. R. D. Oxland, O.B.E., to H.Q., Wessex Bombing Area, Andover, for Air Staff (Training) duties, 20.12.31.

Squadron Leaders: W. B. Farrington, D.S.O., to H.Q., R.A.F. Cranwell, 19.12.31. S. L. Quine, M.C., to School of Army Co-operation, Old Sarum, 12.12.31. J. A. W. Binnie, to H.M.S. Furious, 17.12.31.

Flight Lieutenants: W. A. Thompson, to Signals Section, Biggin Hill, 19.12.31. E. B. Webb, to No. 2 Flying Training School, Digby, 16.12.31. V. B. Bennett, to No. 26 Sqdn., Catterick, 23.12.31.

Flying Officers: F. J. Taylor, to R.A.F. Depot, Uxbridge, 26.12.31. M. M. Restell-Little, G. F. Overbury, C. A. Washer, all to No. 2 Flying Training School, Digby, 16.12.31. L. R. Stokes, R. C. Dawkins, A. H. Abbott, all to No. 3 Flying Training School, Grantham, 16.12.31. N. Stratton, C. V. Ogden, both to No. 5 Flying Training School, Sealand, 16.12.31. R. W. K. Stevens, P. D. Cracroft, A.F.C., both to R.A.F. Training Base, Leuchars, 16.12.31. H. C. Marett, R. F. Gandy, R. Ellison, P. B. Coote, C. H. Turner, all to R.A.F. College, Cranwell, 16.12.31.



THE ROYAL AIR FORCE MEMORIAL FUND

The usual meeting of the Grants Sub-Committee of the Fund was held at Idlesleigh House on December 22. Mr. W. S. Field was in the chair, and the other members of the Committee present were: Mrs. L. M. K. Pratt Barlow, Mrs. F. Vesey Holt, Squadron Leader A. H. Wann. The Committee considered in all 15 cases, and made grants to the amount of £327 19s. 10d.



Reorganisation of the Armament and Gunnery School

In order to develop the armament training of the Royal Air Force, it has been decided by the Air Ministry to reorganise the Armament and Gunnery School at Eastchurch and the R.A.F. practice camps. The following alterations to the existing organisation will take effect from January 1, 1932 :—

Alteration of Titles.—The designation of the Armament and Gunnery School will be the Air Armament School, and the R.A.F. practice camps will be known as armament training camps and numbered as follows :—

No. 1 Armament Training Camp, Catfoss; No. 2 Armament Training Camp, North Coates Fitties; No. 3 Armament Training Camp, Sutton Bridge.

(i) The Air Armament School will be placed directly under the Air Ministry for all matters affecting armament training.

RESERVE OF AIR FORCE OFFICERS

General Duties Branch

L. A. Hackett is granted a commn. in Class A as a Flying Officer on relinquishing his commn. in the Auxiliary Air Force (September 7, 1931). The follg. relinquish their commns. on completion of service :—F/O. R. F. Overbury (November 2, 1931); P/O. S. O. Tudor (August 17, 1931).

The following Flying Officers relinquish their commns. on completion of service and are permitted to retain their rank :—E. V. Culverwell (August 1, 1931); A. S. Budge (October 10, 1931); E. N. Fenton (December 12, 1931); D. H. Murray (December 12, 1931). P/O. C. H. Barnes resigns his commn. (December 18, 1931).

SPECIAL RESERVE

General Duties Branch

P/O. P. W. J. Pharazyn is promoted to rank of Flying Officer (November 30, 1931). The commn. of Pilot Officer on probation D. C. Beauchamp is terminated on cessation of duty (June 25, 1931).

AUXILIARY AIR FORCE

General Duties Branch

No. 600 (CITY OF LONDON) (BOMBER) Squadron.—F/O. L. A. Hackett relinquishes his commn. on completion of service (September 7, 1931).

No. 601 (COUNTY OF LONDON) (BOMBER) Squadron.—P/O. A. C. M. Jackman is promoted to rank of Flying Officer (November 3, 1931).

Stores Branch

Flight Lieutenants: C. H. Masters, R. G. Sims, both to R.A.F. Depot, Uxbridge, 26.11.31.

Flying Officers: F. C. Read, to Station H.Q., Duxford, 14.12.31. B. S. Cartmel, to H.Q., R.A.F., Cranwell, 14.12.31.

Medical Branch

Squadron Leaders: R. Boog-Watson, to R.A.F. Depot, Uxbridge, 15.12.31. C. T. O'Neill, O.B.E., to R.A.F. Depot, Uxbridge, 22.11.31.

Flight Lieutenants: J. C. Neely, J. Kemp, P. J. McNally, all to R.A.F. Depot, Uxbridge, 11.11.31. C. G. Harold, to R.A.F. Depot, Uxbridge, 15.12.31. W. Gamblen, to R.A.F. Depot, Uxbridge, 26.11.31.

Flying Officer: R. N. Kinnison, to H.Q., Iraq Command, Hinaidi, 18.12.31.

Dental Branch

Flying Officer: E. Sharp, to Medical Training Depot, Halton, on appointment to a non-permanent commn., 14.12.31.

NAVAL APPOINTMENTS

The following appointments have been made by the Admiralty :—
Lieut.—Sir Robert A. Clayton-East, Bt., attached to R.A.F. (Jan. 17).
Sub.-Lieuts.—A. A. F. Talbot, J. Casson, D. H. Elles, and V. C. Grenfell, attached to R.A.F. (Jan. 17).

(ii) The Air Officer Commanding, Inland Area, will be directly responsible for administration.

(iii) The armament training camps will be placed directly under the Commandant, Air Armament School, for all purposes.

The Air Officer Commanding, No. 23 Group, will henceforth cease to control the Armament and Gunnery School and the practice camps.

Royal Air Force. Honorary Surgeon to the King

The Air Ministry announces that the King has approved the appointment of Air Vice-Marshal John McIntyre, M.C., M.B., B.Ch., as an Honorary Surgeon to His Majesty (vice Group Captain Henry Cooper, D.S.O., M.R.C.S., L.R.C.P., who vacates the appointment on retirement from the Royal Air Force).

Fleet Air Arm

ATTACHED naval and marine officers will in future be posted to the Royal Air Force Base, Gosport, instead of to the Royal Air Force Depot, Uxbridge, when sick, taking foreign service leave, etc.

School of Balloon Training—Alteration of Title

The designation of the School of Balloon Training has been altered to "Royal Air Force Balloon Centre," with effect from November 3, 1931. The postal address will remain as shown in the current Air Force List.

AIR POST STAMPS

By DOUGLAS ARMSTRONG

NEW stamps issued for aerial postage by the post offices of the world during 1931 total upwards of 450, an increase of 50 per cent. upon the output for the previous year. Among the most interesting varieties may be noted the Australian issue in honour of the world flights of Air-Commodore Kingsford-Smith, the picturesque Sudan series showing the Gordon memorial at Khartoum, the special issues for the Zeppelin and Do-X. flights, the stamp commemorating the Italian seaplane formation flight across the Atlantic and the numerous emissions called into being by extensions of the air mail services in South and Central America.

Not a few of the air post stamps of 1931 already stand at a premium in the collectors' market, as for instance the first printing of the three pictorial air stamps of Newfoundland already advanced in price by nearly 300 per cent. as the result of the adoption of watermarked paper within a short time of their appearance.

From the Antipodes

Included in the Christmas air mail from the Antipodes delivered in London by Air Com. Kingsford-Smith on December 16 last were a number of letters from New Zealand franked with the first examples of the special air mail stamps just issued by the Dominion post office. In denominations 3d. brown, 4d. purple and 7d. orange, they show, in traverse rectangular format a picture of an aeroplane passing over Lake Wakatipu. Letters originating in New Zealand were impressed in addition with a special cachet in red reading "Christmas Air Mail. First Official Flight New Zealand-Australia-London, 1931," and were postmarked November 11, 1931.

Those from Australia were prepaid by means of the latest 6d. air mail stamp in a modified version of the Kingsford-Smith type, the special cachet, struck in purple, being inscribed "Special Air Mail Flight, November, 1931. Australia-England," with winged insignia in the centre. Souvenir envelopes were also provided by Australian National Airways, Ltd. It is understood that the total number of letters carried was in the neighbourhood of 50,000.

Latest issues

The last weeks of the old year brought some notable additions to the air stamp album. Central America was particularly active. From the Canal Zone came the long-promised set of six air stamps in a definitive design of an aeroplane passing over the Gaillard Cut of the Panama Canal recess printed at the Washington Bureau of Engraving and Printing in denominations 5, 10, 15, 20, 40 cents and \$1. At the same time, the inauguration of a national air post service in the adjacent Republic of Panama was signalled by a special 5 centavos stamp. Guatemala provided two provisional issues, the one over-printed "Aereo Internacional, 1931," and the other "Primer Vuelo Postal Barrios-Miami, 1931," on the occasion of the opening of a regular air service between that country and the U.S.A. Salvador indulged in a special stamp issue commemorating the 150th anniversary of her independence, which was available for air mail purposes only, to the tune of 6,000 series of four denominations.

Nearer home, the existing air post stamps of Latvia are being sold at a premium upon face value, denoted by a surcharge, on behalf of the national army reserve, in a limited edition of 30,000 sets. Picturesque air post stamps have also appeared in Tripolitania, in connection with the 25th anniversary of the Italian Colonial Institute of Agriculture, the design representing an aeroplane passing over some Roman remains. Spain's latest commemorative series in honour of the Black Virgin of Montserrat embraces, as usual, a supplementary set of values for exclusive issue upon aerial communications.

Air Stamps in Prospect

New issues of air post stamps may be expected early in the New Year from Chile, China, Egypt, Greece, Venezuela, and Costa Rica. The Chilean series will be of a permanent character, replacing the present overprints upon the ordinary postage stamps, and will be reserved for foreign air mail matter. The Egyptian set will comprise eleven denominations, ranging from 1 to 200 milliemmes.

ANSWERS TO CORRESPONDENTS.

W. S. (Durban).—Your letters arrived too late for despatch by the first London-Capetown air mail, which left unexpectedly on December 9 last. They will be forwarded,

however, by the inaugural flight of the regular weekly service on January 20 for which envelopes of special design are also being provided by Imperial Airways, Ltd.

R. H. B. (Maidstone).—The market value of cards carried on the First U.K. Aerial Post from London to Windsor in September, 1911, depends upon the colour of the vignette, and also, to some extent, on the date of the postmark. Yours being posted on September 9, and being one of 5,000 despatched by the firm in question, would probably realise no more than from 5s. to 7s. 6d. You might offer it to Messrs Francis J. Field, Ltd., Sutton Coldfield, Warwickshire.

PUBLICATIONS RECEIVED

Die Luftverkehrswirtschaft in Europa und in den Vereinigten Staaten von Amerika. By Prof. Dr.-Ing. Carl Pirath. Vol. 4 of *Forschungsergebnisse des Verkehrswissenschaftlichen Instituts für Luftfahrt*. R. Oldenbourg, Glückstrasse 8, Munich. Price M. 8.

Up: A True Story of Aviation. By "Jack" Stearns Gray. Shenandoah Publishing House, Inc., Strasburg, Virginia, U.S.A. Price \$3.00.

Engine Handbook for Menasco B-4 Pirate Engine. Menasco Motors, Inc., 6,718, McKinley Avenue, Los Angeles, Cal., U.S.A. Price \$2.50.

Canada's Western Arctic. Report on Investigations in 1925-26, 1928-29, and 1930. Department of the Interior, North-West Territories and Yukon Branch, Norlite Building, Ottawa, Canada.

Neuzeitlicher Verkehrsbau Compiled by H. Gescheit and K. Wittmann. Müller and J. Kiepenheuer G.m.b.H., Viktoriast. 36, Potsdam, Germany. Price RM. 50.

The Moth Two-Seater Light Aeroplane, Gipsy Mark I Engine. Air Publication 1,422. Vol. 1. London: H.M. Stationery Office, W.C.2. Price 2s. net.

NEW COMPANY REGISTERED

CHALLINOR, CUNLIFFE & RODGER, LTD. Capital £500, in £1 shares. Manufacturers and proprietors of, agents for and dealers in aeroplanes, speed boats, motor cars, and the engines and component parts thereof, etc. Permanent directors: W. R. Challinor, M.B.E. (chairman), "Gorsefield," Clifton Drive, Lytham, Lancs (director); Vulcan Motor Services, Ltd.; Star Paper Mills, Ltd.; and Vulcan Motor & Engineering Co. (1906), Ltd.; J. Cunliffe, 118, Fleetwood Road, Thornton le Fylde. J. Rodger, 16, Cromer Road, Hartshill, Stoke-on-Trent. Solicitors: Challinor & Dickson, 32, Cheapside, Hanley.

AERONAUTICAL PATENT SPECIFICATIONS

(Abbreviations: Cyl. = cylinder; i.c. = internal combustion; m. = motors. The numbers in brackets are those under which the Specification will be printed and abridged, etc.)

APPLIED FOR IN 1930

Published January 7, 1932

- 34,612. G. FOGES. Direction-finding apparatus. (363,094.)
35,983. A. E. SHORT and H. O. SHORT. Multiplane aircraft. (363,109.)
37,755. BLACKBURN AEROPLANE AND MOTOR CO., LTD., and J. D. RENNIE. Means for controlling the airflow on aircraft wings. (363,130.)

APPLIED FOR IN 1931

Published January 7, 1932

- 2,910. WRIGHT AERONAUTICAL CORPN. Cooling devices for i.c. engines. (363,201.)
3,152. OTTICO MECCANICA ITALIANA SOC. ANON. Compass for aircraft, etc. (363,204.)
11,030. DORNIER-METALLBAUTEN GES. and C. DORNIER. Storage of fuel in flying boats. (363,262.)

FLIGHT, The Aircraft Engineer and Airships.

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